

QL S.U.B.

THE MONTHLY PUBLICATION OF QL SUPER USER BUREAU

This issue!

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Issue (Zero)

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What's what in the mag...

at risk of explaining what is obvious, we shall endeavor to give you explanations of the intended purpose of each main heading of the magazine, and give you some ideas about what we expect to be adding in the future, though as you may appreciate, when we're dealing with something as unpredictable as the QL market, developments may overtake our plans.

EDIT, the Editorial

EDIT, as you may already have gathered, is simply my (usually much less prolonged) ramblings about the making of each issue, and the reasons behind the inclusion of monthly features or changes in the format. I may sometimes take the opportunity to include information about new developments or changes to services that we provide.

News Desk

NEWS DESK is, surprisingly, our news section. Nothing more need be said here, apart from that we shall feature as up to date news as we can each month.

Development Kit

DEVELOPMENT KIT features the gossip, and official future plans of QL companies. That includes news about forthcoming products, plans, and offers.

Write to Reply

WRITE TO REPLY is a section for you, the readers. This section will vary according to the response we get. We will not be able to feature all letters, and some may need to be cut down. This section is not for your own reviews, or especially for your experiences, but is rather for readers views on QL matters. Naturally, the letters published will not necessarily reflect our own views!

Good, bad, changed medium?

GOOD, BAD, OR CHANGED MEDIUM is our detailed software reviews, and previous section, and we will be featuring the latest software as soon as we can, and classic programs from time to time. All articles will include either screendumps or photos, of the programs as appropriate. We will include full details about known problems where we can, and detail about media useable, documentation, and items of particular interest.

We have developed some very silly habits—just so that the software gets the most rigorous error testing.

System Variables

SYSTEM VARIABLES is where we examine the hardware for the QL, and feature reviews of the latest products, and sometimes a look at older equipment. We include compatibility details, and information about various features of the product. If there are a number of versions, then we will review the basic one, and give full comment on the basic upgrades available.

Protocol Converter

PROTOCOL CONVERTER is our comms section, where we deal with the world of communications, and give up to date information about bulletin boards, communications services including Prestel and Telecom Gold, and our plans for our own QL bulletin board "Super User Board". We will be running a series, following development of it from start to completion, and full accompanying details for both novices and experts, and those between them.

Manual Response

MANUAL RESPONSE is our problem (and solution) section, where we select some of the problems you have written to us with, and answer them publicly. If you have a problem, write to us anyway, enclosing a stamped addressed envelope. We cannot afford to answer letter unless you do this unfortunately. We will reply as soon as possible, but we may choose to publish your letter as well with your permission if it is useful.

Finest Hardcopy

FINEST HARDCOPY is our program listings section. Each month, a program will be published, from us, another author, or from the public domain library we are developing. As an extra service programs are available ready typed, on disc or cartridge, for a variable fee, on receipt of a blank disc or cartridge.

If you have any program that you would like to submit to the library, then please send it on a microdrive cartridge or 3.5" disc, together with appropriate info, and enclose a suitable stamped addressed envelope for return. We will assess the program, and if we feel that it is suitable for inclusion in the library, then we'll agree a royalty fee per copy with you. We will charge £1.00 for copying, post, and administration. The rest is paid directly to the author if you wish, as a royalty, at agreed intervals.

Investigation

INVESTIGATION is where we focus on an area of computing for further

investigation. Each month there will be something different, and will include features about other computer systems, new developments in computer technology, and other computer related topics such as education and electronics.

Moving Target Competitions

MOVING TARGET is our monthly competition. It is not based on luck or skill necessarily, but we will be designing it each month to give all our members the best chance of winning. We will be giving software as prizes usually, but sometimes we will be able to give credit to winners, to choose a prize of their choice from our list.

Benefits in Store

BENEFITS IN STORE is where we detail all our latest discounts on our range of QL products to members, and give details of any special, or short term offers such as new product offers or bulk discount on items such as microdrive cartridges or discs.

Reader Exchange

READER EXCHANGE is a section devoted to readers sales and wants. As "QL S.U.B." is read by committed QL users, if you have any QL products for sale that you no longer need, or you want something that is no longer available, then you can advertise effectively and inexpensively in this section.

The names of anyone found to be selling pirated software, will be passed on to the original supplier, and will be liable to subsequent prosecution, and loss of membership.

If you have a product that you have designed, then please contact us for details about advertising rates, or promotion enclosing full details about it. We will wish to review it for the benefit of readers, but we must be sure that it's as described. If it is an item of software, then please ask us about our new budget software or consider selling it through our library. Call to discuss it.

On Record

ON RECORD is a dependent on the help of QL companies. We hope to be able to interview some of those people who have a hand in the QL market today, and ask their views on the future of QL matters, and their plans. If you ask us to chat to someone, then we will do our best to put them on the spot, and report the truth.

If you know someone who is willing to talk to us, and would be of interest to members, then let us know. We are always looking out for interviews.

Backspace

BACKSPACE is page of personal views. We will be publishing both our own ramblings on QL matters, and the views of our readers from time to time. We will certainly be interested in your letters, and full articles sent in, although we cannot pay for anything printed, or guarantee that anything will be used.

We can only accept documents from Quill or an editor, on either microdrive cartridges or 3.5" discs. Please note they will not be returned unless, (until) we receive a suitable stamped addressed envelope.

Developments to come

We have lots of developments planned for "QL S.U.B.", and we hope to be featuring courses on programming in SuperBASIC, (on the interpreter, and for one of the compilers), Pascal, Forth 79, M68000 assembler, and C, in the future, and linking them to the steady development of useful programs that should multi-task on the QL or other QL compatible machines. Others may be featured occasionally.

As you may have noticed, this issue has no advertising in it, although you may realise that we do normally take commercial advertising. This time, you may have received a supplement to the magazine, in which any adverts were printed. This is due to the long term basis of the magazine. Updates are only possible in a supplement.

Usually, adverts will be mixed in with the magazine contents. Please remember though, that you are guaranteed your forty pages a month of magazine. The adverts are extra to that. If you are interested in taking advertising, then you will find our rates included, and should you wish to take some, then please contact us. We will be happy to discuss your requirements.

The Front Page Headings

Each heading is only a guide to the contents. Each individual section starts at the page as given on the front page, but may include a number of items in each section of generally the same type. For example, we will have a number of reviews of software and or hardware each issue, but only the page of the first one will appear on the cover. However, to help you find your way around, the articles will always be in the same order, and on the same (possibly colour) paper.

We hope that you enjoy this issue, and that you will take advantage of our services. Incidentally, we would be willing to sell individual copies as they become available at a pound each, but we can only offer membership to those people who subscribe.

NEWS DESK

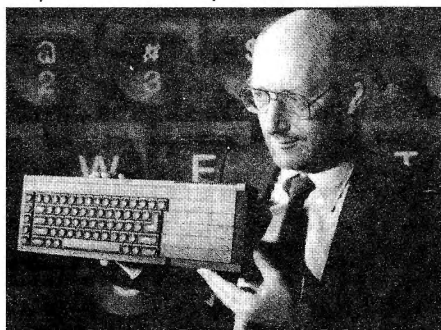
In this issue, we have decided to focus on the troubled history of the Sinclair QL, from its glorious launch amidst the splendour of a Sinclair press party, to the miserable days of the post Amstrad takeover, and now the more recent resurgence in QL fortunes.

The QL has certainly got a much longer history than many machines launched at the same time. Many of its peers have now vanished into the mists of micro-computing history after lengthy death throes, or have burnt themselves and their sponsors out in bursts of heavy developments, and press advertising.

Launched in January 1984, the QL may look "long in the tooth" in terms of microcomputing history. If the usual terms of reference for computers were used, then the QL would have around a year to go before it was totally out-dated, and useless. Why is the market so strong now then? We shall look at the troubled past for the answers.

THE CLAIMS AT THE LAUNCH

Against a backdrop of a huge QL keyboard, Sir Clive held up a QL, saying that it was revolutionary. The press material distributed at the time of launch was impressive. Glossy silver brochures, and demonstrations of the QL software suggested that for once, despite rumours to the contrary, Sir Clive had got something launched on time, with a real product available.



THE CRITICS AND SCEPTICS

The claims of the promotional material did not seem to be overstating the QL as a serious professional machine for the home or business. Even the claims of a number of expansions coming soon seemed real enough, as everything was clearly going to plan for Sinclair.

The journalists clamoured to order the machine, (launched at £399 -news for those of you who picked up the machine in recent days for less!) and join the QL support group QLUB, launched at £35, and offering 6 newsletters a year, and special deals on software, along with help, -news for those of you who have thought about subscribing to "QL SUB"! They were the first of over 10,000 to join, and the first of an estimated 80,000 to buy direct.

The press was generally in complete praise of the machine. A few voices of dissent could be heard, but were drowned out by the wave of euphoria accompanying the launch. The machine was compared with the opposition, this being seen mainly as the BBC micro, and the IBM PC. Sinclair composed charts comparing most machines, and naturally the QL won on them all.

Soon after the launch of the Sinclair QL, Apple launched the Macintosh, another machine with 128k, and a £8000, but offering a complete, more portable unit comprising screen, keyboard, and mouse. Since then, the Macintosh has also gone through bad times, but has recently emerged to be heralded as serious opposition to IBMs future plans for microcomputers. It is interesting to see how more advanced machines are only now becoming widely available, and widely accepted.

THE ACCLAIM AND RESPONSE

As weeks turned into months, however, and it became gradually clear that the 28 days promised was liable to be 28 weeks, the press began to wonder. How could a machine be taken seriously by business if it was so very late? They began to examine the specifications more closely, picking on small points about the processor, and suggesting that the Spectrum could be faster. The windows mentioned were not like the Macintosh, they were just clever screen handling, not real windows. The microdrives were slow and inefficient, and £5 for a cartridge containing 100k seemed expensive. And the keyboard...

Meanwhile, Sinclair had found that the operating system and SuperBASIC would not fit in 32K, and they started to cut down the ROM drastically. This only made the delay worse, and in the end it was clear that 48K was needed. Many of the good routines had gone, and many needed writing again. Lots of loose ends were left, and so the first machines went out with ROM cartridges plugged in the back to accommodate the extra 16k that wasn't planned for.

An Extended EDITorial.

Super User Bureau (S.U.B.) is a professional support group for users of the Sinclair QL, the CST "Thor" series, and the QXT-640. We are committed to supporting all QL compatibles, including the developing plans for Sandy's new QL compatible, the "Futura". Should other QL compatibles, in any form, now become available, then we will be giving them our full service support, along with the other machines. The idea of a version of QDOS for the Atari ST, or Commodore Amiga has even been discussed in some quarters, as has a compatible PC card.

We can also provide help and assistance (to a slightly lesser degree, as we do not publish a monthly magazine for either) to users of the ICL "Time Per Desk", and Merlin "Tonto", which are both partly developments of the basic QL design.

The organisation has been developed over a period of several months with some degree of consultation with a number of QL companys. We are not linked to any other company in any way, either directly or indirectly, and we stress our independence. Some commercial user groups are linked to parent companies, and they may be obliged to recommend particular systems, or try to sell the items that they can get at the best rates.

We try to stock all QL items, and through "QL S.U.B." we try to provide our members with up to date information about the latest products, and detailed independent reviews of them. By reviewing, and subsequently stocking any particular item, we are in no way endorsing that item rather than another.

This is the introductory issue, and because we shall be sending it to everyone ordering an introductory copy, or joining directly, it contains general information that will still be of interest at any time, rather than the transient nature of news and reviews that we carry in normal issues of the monthly magazine. I shall explain in every section, what the purpose of it is, and give you some indication of the nature of the material that will be normally be featured.

Some of the usual features of the magazine have had to be dropped or replaced in this issue, (for something equally interesting hopefully), because they need some kind of response or input from our readers, and correspondents.

Because of the exceptional nature of this issue of the magazine we will also be including more information about the services we provide, and the benefits that we have to offer at the moment. As the popularity of services,

and their costs to us will change from time to time, and the availability of offers that we can make to our subscribers will vary, you should receive information about these seperately aswell.

We are dedicated QL users, and naturally we run our business using a network of QLs, and QL peripherals. We keep records on QLs, do our word-processing on QLs, do our finances on QLs, and do the desktop publishing on our QLs. We do not use QLs simply because we provide a support service for them, but because they provide us with a powerful and versatile system that cannot, to our minds, be beaten at present. We have faith in them due to the many hours of programming, and business that has been done on them up until now.

As committed QL users as well as QL specialists, we can offer you the best help in using and making the most of your QL too, whether you use it for personal use, be it financial, science, programming, graphics or games, or business, be it accounting, database management, desktop publishing or whatever.

Super User Bureau was formed with the aim of providing users of the Sinclair QL, and various compatible machines with the kind of professional full time support that users of more expensive business systems have available, and to offer the kind of services that are only available (at great cost) to users of those systems, at more realistic prices that are now practical in the QL market. We know the kind of thing that we would like to have available, and we offer those services to you. If you have any ideas about services that you would like to see us provide, then we will be glad to hear from you, and discuss them with you.

We hope that we can help users to make the most of their QLs, rather than spending money unnecessarily on new computer systems that cannot match the QL for power or versatility.

Lastly, we would like to point out our position regarding other user groups. We are not here with the intention of replacing either QUANTA, or other user groups, but of providing support for users of the QL, and compatibles. Some people might feel that we are in direct competition with other user groups. We feel that we are providing a service that is not available at present, and that there is not reason why anyone should belong to only one group. We feel that the more support for QL users the better.

We welcome friendly links with other groups, whether they be local or even national, and if we can be practical assistance in providing anything for those groups, within our limited means, then we will be very happy to do so. Just call us and discuss it.

DEVELOPMENT HIT

The QL has a long, and chequered history. In this very issue, you will find a whole section devoted to the past history of the machine, the ups and downs, and the truth about the development of the machine you use.

But what of the future? Is there a future for a machine once called the Quantum Leap, later the Quite Late, and finally the Queer Lump. Can the QL continue to go where no other computer has dared to venture in offering power without the price? (There is a slogan in there somewhere for someone...)

At the present time, there seem to be a number of options for the dedicated QL user, and a number of options on the horizon, looking promising, but never coming to full light for real inspection, or assessment. We will be discussing these options further here, and trying to take some educated guesses about the future of the QL.

There are also a number of machines that are in direct competition to the QL, although in a far more mass market, high profile way, and could even be possible routes for the QL market to develop, by implementing a version of QDOS on those machines. We will also be discussing the various merits of these machines, and attempt to compare their merits with those of a QL, to an existing QL user, and a new user, for use in similar tasks.

AMSTRAD PLANNED QL DEMISE

The QL market was expected to die, when Alan Sugar, "Mr. Amstrad", bought out Sinclair, received the QL rights as part of the package, and announced that he had no plans for the machine, and that it was no use anyway. He then proceeded to sell the existing stock to Europe on the condition that they could not be imported back into the UK, (having already refused British bids,) and then announced point blank that no matter what was offered for the rights to the machine, he would not sell. A pretty comprehensive way to deal with a machine you dislike...

Why then, is the QL market stronger now than ever before? Why are more new software products being launched now, and more hardware additions available than ever before? It is not a high street rebellion, with computer dealers stocking up with the latest products, and pushing the machine. Far from it- most dealers never dealt with the QL much, and many pulled out at an early stage. So what has the QL got?

It seems that the QL market has grown out of the confidence, and loyalty of QL users. Unlike the owners of other machines launched at a similar time, owners of the QL seem to believe that the machine has what it takes, and that it is as good, or better, than some of the newer machines- and the market eventually realised that the QL was here to stay, and had an eager market of product hungry users.

One of the first, and potentially most important boosts to the QL market after the Amstrad takeover, was the announcement, within weeks of each other, of two new machines offering greatly expanded potential, and power, in a more professional format, for the QL user, and both retaining full use of existing software. These were the CST "Thor", a new name for a new base machine using the existing QL circuit board, but with powerful developments planned, and what was originally named the QLT, which was to be a new machine offering spectacular power at a low price, later known as the "Futura".

The QLT was so called, we were told, because the machine would be Quality. Perhaps more importantly, the T stood for Tebby, Tony Tebby, the QL guru who had helped to design the QL, QDOS, and many of the QL expansions available.

The development of these programs is now history up to this point. However, both machines have developed further, although only the "Thor" is available, and the "Futura" still developing in theory, is rapidly becoming a myth. Perhaps when you read this, the latter will be available, but almost without doubt, there will be a new "Thor", the "Thor XVI", offering many of the features promised for the "Futura".

There are also new hardware additions planned for the QL, and even new QLs planned for other machines. (You may well be confused with the second statement, but it is correct- there are plans to produce a QL compatible card to plug into an IBM PC clone.) There are suggestions that a new IBM PC compatible interface may be launched for the QL, to allow it to run some IBM PC software, and if that occurs, then the QL has a startling new future! There are also early plans for other second processors, even the idea that an INMOS Transputer could be added to the machine- that, for those who have somehow missed it, is "the chip" at present- it offers incredible speed, and infinite expansion, as each time another Transputer is linked up, the processing speed almost doubles!

Psion was having equal problems with the four programs, having written them in C for convenience, they found that when they converted the programs to run on the QL, they filled up the 128K memory almost completely, leaving very little free. Even worse, they had to access the microdrives a lot due to the shortage of memory, and because the packages needed to load overlays, sections of program stored on disc to load in place of existing routines. Their use was often incorrect, and the microdrives earned a bad reputation.

The critics slammed the machine, and the QL quickly slipped from favour. It earned a number of nicknames, none of which were favourable.

Eventually, the QL became available in the shops, in a refined form more like that promised. The machine did not have the appalling bugs of the early versions, and the packages, although poor, were not dire. Software, always the significant way of judging success almost entirely failed to appear. The only programs available were very poor conversions of Spectrum BASIC games—not an encouraging prospect for the potential QL user. Sales dragged...

Meanwhile, ICL produced a machine based on the QL called the One Per Desk. An odd name, but an excellent machine, it offers/offered unique features— an integrated phone/computer environment, with the Psion packages, (refined and named Exchange) and ICL system software to control the unique operation of the multi-tasking system. It met with a rather dubious, mixed reception at the time of launch, but has since become a steady seller from both ICL, and Merlin, British Telecom, where it is marketed as the Tonto.

STILL PROBLEMS A YEAR LATER

Even a year after launch, when most machines with a future would hope to have a thriving market, and a large software base, the QL market was dead. The problem was partly that the QL was too advanced for its time. Most of the software writers were used to the Z80 of Spectrums, or 6502 of the BBC, and it took some time for them to learn how to make the most of the far more powerful 68008, a newer breed of chip.

New versions of the Psion programs were made available, these being version 2. They were a vast improvement, having been rewritten in machine code to make them smaller and faster. Later versions up to 2.35 have become available since, and they correct bugs and improve performance in many ways.

The RRP price was halved, from £399 to £199 overnight, with no warning. Sales according to Sinclair, soared. Dixons had one point where they could not get machines fast enough to supply demand.

The future of the QL was beginning to become a little more rosy, and then almost as quickly, sales died down again, and sank back into a steady decline. The price began to drop.

GRADUAL DECLINE IN SUPPORT

It was not until May 1985 that the last UK ROM for the QL was available in production QLs. That is the JS ROM. It corrects most errors, and is the first to attempt to implement the WHEN ERROR error trapping commands, and a number of other additions, including a number of improvements to QDOS.

By this time, despite improvements to the machine in a number of areas, from the general reliability of BASIC, and the microdrives, to new versions of the Psion software, the machine was losing commercial support as fast as it was improving. (Quite fast!) The press were already writing it off, and many high street retailers dropped it. Dixons started bundling it with a cheap printer, (actually it is the same printer that was supplied with the IBM PC junior— it really is!)

AMSTRAD SPELLS OUT QL FATE

When Sinclair hit financial problems and needed someone to bail the company out, Amstrad stepped in. Having the QL and not wanting it they sold remaining stocks abroad, the plan being to remove the machine from the market for good, and to finish it off. In the event, other companies became very keen to buy the rights, realising that there was a very annoyed market with very little support, ready for action.

All attempts failed, but the market rallied. Sales of cheap stock (as low as £99 at one time— far less than cost price) boosted the market. Companies launched new software. CST and QJump announced new machines. QL companies pledged continued support, and tried to organise increased market image. Somehow, the market survived. Somehow the machine gained in esteem.

THE MARKET AS WE SEE IT NOW

Now the QL is one of the established favourites among a certain elite, (or so I am told), of the micro market. It enjoys a dedicated following, and has established a certain reputation for serious computing, and applications of undeniable quality. It still holds its own against potentially more powerful opposition, and it now boasts a large and healthy software market, backed up by a reliable, and sophisticated range of hardware, that is still growing.

The QL will continue in one form or another far longer than other micros. It has the secret of eternal youth.

SANDY "Futura"

The QLT, later taken on for production by Sandy, and renamed the "Futura", (seldom has a name been so accurate), first a rumour, then a controversial prototype, (there was considerable controversy as to whether it existed or not), a revised final version, a delayed production version, and now...

The machine has specifications on paper that make any QL user go soft at the knees, and I have actually seen one working, (or was I dreaming?) and gradually all the bits of the machine are filtering through to the QL user, as upgrades, options, and coming soon products. It seems that all that needs doing is for somebody to get the final bit, the main circuit board, and some alterations to QDOS on the QL done, and the machine would be ready to go!

However, at this time, the future of the "Futura" seems to be hanging in the balance. The need among users of the QL is there, the market is there, but the commitment in the market seems to be lacking. So near, and yet so far...

One company has thought of producing a card for IBM PC compatibles that would allow them to run software intended for the 68000 processors, and a number of operating systems, including a version of QDOS could then be run on the machine. The "Futura" would then be bought by buying a cheap PC clone, plugging in the card, and hey presto! You would have a fully operational machine that could run either QDOS, MS/DOS, or lots of other software. The advantage of this approach would be that it could be cheaper than putting together all the components into a new machine, and yet it would effectively be two powerful machines in one.



At the time of writing, a number of the components of the system are in development for implementation on the QL, but a number are already available in a form suitable for use on the QL.

The keyboard illustrated here has been designed specifically for the "Futura" and offers 100% compatibility with the

QL, whilst offering extra features including 10 function keys, a numeric keypad, and a number of special keys. At present, it is available in either as a plug in option for the QL, or with an expansion console that allows QL disc drives, expansion cards, and microdrives to be housed in a matching unit - a taste of the "Futura" to come.

Qjump, responsible for the original design of the hardware, and QDOS compatible operating system of the "Futura", have brought out the POINTER system for the QL, marketed with a series of programs designed to take advantage of the POINTER system. DRAM, a system management program, QTPP, a realtime system spelling checker, and various design programs are probably already available as you read this.

The system allows programs to multi-task efficiently, offering automatic screen saving when swapping between programs, and a new windowing system that almost any program can exploit.

To the Psion suite user using the system, their programs behave as on a standard QL, but when swapping between them with CTRL C, the screen of each program is displayed correctly, and instantly. The system makes the entire operation of the machine more natural, allowing users to bring any program loaded, but not in use, to the top of the pile, like the way one rearranges paper on a desk as one changes from one task to another, when necessary.

The system is quite heavy on memory requirements, really requiring 640k of RAM, or more, though it will operate in less. It is ideally suited to a machine like the "Futura", where the expansion potential is practically unlimited if you can afford it. It also benefits from the addition of the Qjump designed mouse, which can also be fitted to the standard QL.

Other advantages planned for "Futura", apart from general speed increase of up to 5 times, include memory capacity to 8mb (8192k), better QL compatible graphics, with options for up to 65536 colours, stereo sound, and midi in/out for musical instruments, a built in SuperBASIC compiler, the option of an interface to run IBM software, and very good expansion options for other hardware designers for yet more power.

The "Futura" would offer the QL user the ultimate feeling of security, in that it would allow the owner to plug in a more powerful processor, graphic card, or memory capacity, if and when it was needed, without encountering any of the limits of normal machines.

Thor

The CST Thor, first announced in 1986 as a powerful upgrade path for QL users, is still developing in that direction. The original "Thor" was little more than a QL in new case, with an IBM style keyboard. The disc drives that users had long become accustomed to seeing standing next to the monitor, were placed in a sleek new console, with a new power supply, the QL main circuit board, a memory expansion, various interfaces, into which the IBM style keyboard and matching mouse could be plugged.

The Thor, designed by CST, a company which had started by dabbling with the QL, but had soon become absorbed with the machine, had already earned a good reputation for their fast RAM cards, scientific interfaces, floppy, and SCSI hard disc interfaces, and four way expansion unit, designed to allow the ambitious QL user to be able to plug in all their expansions. It seemed that a complete machine would be almost a natural progression, so in the wake of Amstrad, came the "Thor".

When the "Thor" was launched, a number of developments for the basic model were also planned, and CST has had them available for some time. They now offer three models of the "Thor", the Thor 1, mainly an improved QL, fitted with 640k RAM, an IBM style keyboard with numeric keypad, parallel port, mouse port, battery backed clock, an optional hard disc, an EPROM expansion board for up to 128k, and extensions to QDOS to provide real windows, and an optional graphic control system.

The Thor 20, a machine fitted with a 68020, a more powerful chip from the same "family of processors" as the QL processor, and the Thor 21, the same as the Thor 20, but with a chip that does floating point maths, so that the machine performs even faster when number crunching, for scientific use, are otherwise the same as the Thor 1.

Finally, the promise of a new machine has now become reality, at least in a prototype form at present, though in production soon, probably by the time you read this. The outward appearance of the machine is the same, although inside, it is an entirely new machine, and should perform as such. The main specifications may change slightly in the final production version, but with the options available, the machine will be easy to expand, and will offer those eager for power, the answer to their needs for years to come.



The machines use a 68000, the same as in the Atari ST, and IBM Amiga. That is a big brother to the chip in the QL, and operates at greater speed, but it also means that the cost of the system to produce goes up.

The machine also features enhanced graphics, with a new graphic mode similar to mode B, with 16 shades of grey instead of colour.

The most important change on the new machines, apart from improved speed, and graphics, is the scope for expanding the machine from the standard 512k, to the possible 6.5mb, or 6656k.

The Thor machines will run most software designed for the usual QL, but may have problems if the program wants to check the codes on a cartridge in drive 2. The Thor 1, 20 and 21, can have one microdrive fitted as an option, but this may not overcome the problem completely for some games. The machine will also work with QL interfaces so you may not need to abandon your present QL system.

AMIGA

The Commodore Amiga is another machine that has never quite won the success that it deserves. It is very similar to the QL, in some respects, and the machine shares features very similar to those planned for the "Futura".

The machine is available in three versions at present, the original A1000, a 3 box designed machine with 256k of main memory, usually sold upgraded to 512k, the A500, a machine designed to combat the Atari 520ST, offering 512k as standard, and a built in disc drive, all in a keyboard unit, and the upmarket A2000, a machine similar to the A1000, but with a large system console containing the disc drives, processor, etc., and having the option of an IBM compatible card, more of which we will discuss later.

The machine uses a multi-tasking operating system, with a full window icon mouse system, including a mouse, supplied as standard. The programs for the machine usually take advantage of the potential advantage of using the standard display format, and so make the machine easy to use. The extra advantage of the system is that it is possible to revert to a system prompt should the user wish to do so, and in most programs there is the option of shortcutting the menus and windows.

The Amigas have been generally praised on all aspects of the system, but the machine is still much less popular than the Atari ST. This is mainly due to the higher than expected price, and problems with the operating system, that have put many people off buying. It seems that all is well now, and the machine's sales are picking up.

The history of the Amiga up to now, is rather similar to the QL. It was first launched some months before the first machines were available, and those first machines had a number of initial problems, which tarnished the image. This meant that the machine fell behind schedule in a number of ways, and the software was slow in coming.

The machines use the 68000, the same as the Atari ST, and Apple Macintosh. The new A2000 machines also offer the option of a 68020, an even faster relative of the QL's processor. The machines now available are also to be updated soon, but will naturally remain totally compatible.

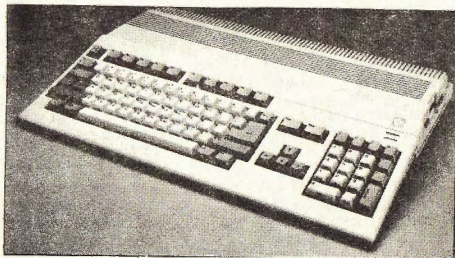
One advantage in the business market, that the Amigas have, apart from a nice name, is the IBM compatibility

option. This is seen as an advantage, especially with the multi-tasking, as a business with Amigas can run all the usual programs and take full advantage of the Amiga's special abilities. The system has not been implemented with a few rough edges, such as the inability to transfer files easily between the two formats of disc, but it is worth having, but now the add-on card is rather over priced- unlike the Amiga.

The Amiga is most well known for its superb graphics, and sound. It has up to 4096 colours, and can perfectly synthesise any sound. It has a built in text to speech converter, so that your programs can talk, and you can even choose to use male or female!

The machine has a wide range of software, but falls behind the Atari ST in the quantity. One thing that is presently rumoured, is an ST/emulator. That would be a tremendous coup for Commodore, as then their machine could run all the software for its rival. As the main objection to buying an Amiga rather than an ST is the software list sales of the machine may well soar.

The Amiga is a very powerful machine, and coupled with the ability to do multi-tasking, it makes an excellent system. However, software written for the machine is not cheap. Games, for example, often cost £25. Business applications often cost several times as much, and the support from the authors is usually more commercial. In the QL market, you can speak directly with the company producing the program if you want, and get personal service.



The cheapest Amiga available, is the A500 shown above. It is currently being pushed for the home market, with the suggestion that all other machines are now toys in comparison. That would be rather an exaggeration, as on some operations, the QL can outstrip the Amiga, and I think that users of a few other machines might be annoyed- in particular users of the "Acorn Risc Machine" which I will talk about last.

It is ironic that in reality the Amiga is "the" games machine. The graphics and sound are so good that the circuit board is being used in some of the latest arcade machines, and the games will also be available on the Amiga!

ATARI ST

The Atari ST computer is the best selling machine in its price range, and offers staggering power for the sort of price that would have bought you a small Spectrum system a couple of years ago. Atari uses the slogan, "power without the price", and for once, they live up to their claims.

There are presently five machines in the range, although the bottom one is due to be phased out, as it does not offer suitable power in one unit! The range runs from the 5285TM, to the mega ST4, the latest addition to the range, and is backed up with a good range of low priced peripherals, from joysticks, printers, hard discs, all the way up to a laserdisc unit soon. A strong high street image, and computer shop network of dealers, along with a number of dedicated magazines, means that the users of the magazine have a feeling of security, and confidence.

So why are we supporting the QL, when the Atari ST is "so good"? We prefer the QL for a number of reasons. Although the QL is an older machine, it used a very forward looking design, by accident or design, and it has a dedicated group of users, in theory, as large as that of the Atari ST in the UK, and sales of the QL are still surprisingly healthy, like the market. We shall go on to explain the features of the Atari ST, and some differences that the user of a QL would experience transferring to an Atari ST system.



The Atari ST range of machines, the 5285TM, 10485TM, Mega ST2, and Mega ST4 offer 512k, 1024k, 2048k, and 4096k respectively, but all share the same features apart from this. They all offer a full size keyboard with numeric pad, cursor block, and ten function keys, a built in disc drive on all but the lowest model, either in

the keyboard unit, or on the console in the mega, hi-resolution graphics in up to 512 colours, lots of standard interfaces, and a mouse. They are also usually bundled with a colour or mono monitor, and some software.

They also feature a standard graphic environment, GEM, that allows all programs to conform to a standard method of control, using the mouse, and making new programs much easier to learn and use, and the machine is driven by a 68000, a big brother to the processor in the QL, meaning that the machine does graphics/work fast.

The machine when compared to the QL, however, has one disadvantage. The QL is far more useful, especially when it has a similar amount of memory, 512k+. The QL can be far more natural to work with, as it allows you to compute like you work. (For a full explanation of multi-tasking, please see the "MANUAL RESPONSE" section.) The Atari ST, in common with many machines, will only allow you to do one thing at a time, no matter how much memory you have.

Although the machine may sound good, a number of the features are really not all that useful to the average user. A businessman may find GEM is elaborate and hard to get to grips with. Using buttons on a mouse, and highlighting menu options from odd names, and then moving sections of screen about... The average user just want to press F for a spreadsheet, and then type in their formulas as they would on paper, or W for wordprocessor, and type as they would on a typewriter, and see what will come out on paper at the end. The features such as 512 colours, complex sound, and musical instrument sockets are of little interest for most.

Although the machine is widely used, it is not particularly successful with business. The QL benefited here with small business, because it came with four good business packages, and could be plugged in, and used. Perhaps it has benefited from being less complex as standard. The QL is well supported with business software, and should the user want the features of the ST, then most are available, making the QL a modular system tailored to your needs.

Atari promise that at some stage, they will launch a multi-tasking version of the ST operating system, so that it can run existing software, but that will be on later machines only. There is also a good operating system for the ST called Mirage, but it does not offer the range of software necessary.

Until such a time as the ST can become as useful as an expanded QL, there is no incentive for users who want to do serious computing, to buy an Atari ST instead of maintaining the QL. If you want a machine mainly for games, then why not consider buying an ST too?

Write to Reply

Dear S.U.B.,

I have only had my QL a few months, and as yet, I have not bought any software for the QL. I am a what I think you call a "serious home user", in that I am serious about using my computer, but I do not use it for business purposes, just computer awareness, and some easy programming. I have got a few games, but I am not really all that keen on the zap and bang games. Are there any educational or useful home programs available for the QL, that do not presume the user is a child, or some kind of bossin who wants everything computerising?

S.U.B. Yes! Sinclair originally planned the QL to be used what he thought was a new breed of user, the home professional. (It is rather like a yeti, as everyone thinks that it exists, but noone is sure!) Well now we know there is one, and it has been proved by the consolidation of the QL market, and the sudden rush to buy cheap IBM PC Clones.

The QL is blessed with four powerful programs as standard, and this allows utilities, and all sorts of personal management programs to be supplied for use with them, in particular with Archive, the Database manager, that allows you to set up and store huge amounts of information in any way you like. As programs can be supplied on microdrive, there are a large number of programs available for it. The QL also has a superb programming language, and even if you don't find programming very much "your scene," it still means that there are a large number of programs available from other users, and available, usually free except for a handling charge, and or the cost of the microdrive or disc. Such programs are called public domain software, and we are building a list of such members' programs.

In this issue, you will also find information about all sorts of different programs, and their uses, but the section does not include information about the serious games, or the particular personal skills that you can learn using your QL. As we don't want to be specific about particular products in this section, suffice it to say that if you look through our list of QL software, (and the lists of other suppliers) you

This issue is a special introductory copy, so the letters section includes a few comments on those printed. Normally, your correspondence alone fills these comment pages.

will find that there is an interesting range of such programs, and remember, should you have a particular requirement, then we will be glad to help if you give us a ring, or write to us. Naturally, if you require a certain board game on computer, and we don't have it, then we can't just write a version (!) but maybe we can put you in contact with someone who has, or will!

I have read in some magazines that the QL is not a very well supported machine, and that it is a "dead" market. Is that true? Does the QL have a certain lifespan in your minds that it will be forgotten about after? Would I be wasting my money if I continue developing my system?

Some members of the computer press have been predicting the early demise of the Quantum Leap since it was launched. Some people, it seems, want the QL to fall prey to the IBM PC standard or to the glossy image of newer machines. The QL market is alive and kicking, and there are more pieces of hardware and software available now, or planned for release, than ever before in the history of the development of the machine. To develop your QL system further is both very cost effective, and a sound investment. There is at present no other machine offering the unique power, and market support of the QL, and you would still have to pay several times the price for a similar basic system. We will be continuing to support the machine for as long as there is a demand, although obviously the exact service may change. We guarantee continued support.

We have lots of plans for developing the services we offer, and plans to promote the market with increased coverage. See our adverts for our latest!

Archimedes

There is one more machine outside the IBM compatible world that might appeal to the QL user. That machine is the highly acclaimed Acorn Risc Machine, the word risc referring to the type of processor, rather than the degree of confidence that it will sell well!

The machine is astonishingly fast, on the PCW benchmark, simple programs used to give often misleading ideas about the speed of machines, and is rated as being 13.82 times faster than a standard IBM PC, or compatible in BASIC. That means that it is also 12 and a half times faster in BASIC than the QL. (However, the BBC micro also works out faster than the QL in BASIC, on short tests, and the QL outperforms the BBC in some areas by up to 100%.)

There is no doubt however, that it is in a class of its own for speed. The comparison suggesting that the machine is 13.87 times faster than an IBM is not really all that helpful really. The machine can emulate an IBM with an emulator, but it runs most programs slightly slower than a standard PC.

The machine already has important language packages available, and will run a lot of existing BBC software, via another emulator. It will be some time before the machine has a decent catalogue of programs available now, rather than later, however.

ARM also features superb sound, and brilliant graphics, similar to those on the Amiga. There is also a range of hardware add-ons, though since launch some have already been cancelled due to expected development costs.

There is definitely going to be a floating point co-processor, which means that when this as yet unfinished chip is plugged in, number crunching scientific applications will become even faster, which will mean that the machine should become widely used in universities. Education will buy the machine just as they have with all the other recent Acorn machines, because they are the latest BBC Micro.

The pricing on ARM is debateable. It could be considered as cheap for the power, or as expensive for the system. The pricing is certainly going to make Acorn very profitable again, but many will see it as an essential bargain.

For business, or serious home use, the machine would be an unlikely choice. Anyone who finds one appealing should look very closely at their real needs.

If you want a more powerful machine than a standard QL, and you don't need the need to conform to MS/DOS, you have the choice between the Acorn Atari ST, CBM Amiga, or waiting for the "Futura". If you want to rationalise your investment in QL hardware and software, and you don't want to scrap your system, then you unfortunately have no choice but the "Thor" as yet.

Remember though that before you even consider buying a new system, that careful consideration of your present system could reveal a component that is causing a bottleneck, whether that is hardware, software or tradition.

The first and most obvious bottleneck to most people is the microdrives. If you are using large amounts of data, or writing long documents, then you are probably wasting time accessing it from cartridge. Disc drives, or extra RAM and a RAM disc, will enable you to accelerate the operation of the file handling several hundred percent.

A program that you use which won't multi-task, if replaced with one that will, may well speed up your work many times. For example if you are using an expanded machine, and still using a spelling checker that you need to load after writing your document, then it will be well worth upgrading to one that you will check text as you type. If you are still using an old version of Quill with a number lower than 2.3, then you may be suffering problems, or delays that can easily be overcome.

Utilities are available to accelerate the screen handling on Quill, and to allow you to define standard letters, paragraphs, or forms, which can all be created automatically with just a few keypresses. A utility like Speedscreen will allow you to speed up the display of all programs running in mode 4, and that is most serious programs.

The QL has a range of surprisingly good language packages, and should you still be struggling with SuperBASIC, then there are three compilers that will allow you to turn it into fast running code that will multi-task with the Psion programs, or whatever.

Finally, if you have got a front end program, for example, that you bought some time ago, then it may be slowing you down now. If you use accompanying programs that rely on the system, then they may be outdated, and prevent you from doing things you would like to, that other people take for granted.

It is easy to get to like a system, and think that it does everything you want- and it is only when you see something else doing something new, that you reconsider your position. It is also easy to be impressed by newer machines that come along with a strong market presence, and claim wonders...

Good, Bad, or Changed Medium.

Software is what makes a machine a success or a failure, at least to a certain extent. No matter how good a machine is, if it has poor software support, then it will fail, and if it can support a large, or very high quality range, then it will succeed.

The QL is blessed with both now, even though that has not always been the case. Infact, for the first year or so of the QLs life, it had nothing of any quality except the Psion programs that were supplied with it, (and they were very poor compared with now,) and the 3D Chess from Psion, followed a later by "Match Point" also from Psion.

Here, we will give you a very brief idea, if you are new to the machine, or you are less experienced with it, what the main serious programs that are available do. In future issues of the magazine, we will be reviewing, in detail, all the new programs that we can, as they are released, including considerable detail, including screen dumps, and technical specifications along with our critical comments.

The five packages supplied with the machine are SuperBASIC, which is very closely linked to the control of the machine, and four packages from Psion, Quill, the wordprocessor, Abacus, the spreadsheet, Archive, the complex data base manager, and Easel, the business graphics package. All four Psion programs are closely related, and are actually slightly cut down versions of Psion Exchange which costs £400+.

Other packages that we shall mention briefly are spelling checkers, "front ends", multi-tasking control programs, utilities, toolkits, other programming languages, and aids to business. This section includes accounts, desktop publishing, and communications.

Quill, the wordprocessor, is a program which enables you to do wordprocessing on your QL. It has a large range of functions to design your page size, set margins, justification, and for the manipulation of text. It also uses a simple WYSIWYG system, which means "What you see is what you get". In fact, the program displays different colours for normal and bold text, and will allow you to set underline, and super or sub scripts with on screen indication of the present settings. This is a great improvement over many wordprocessors which require you to type special characters into the text to set these typefaces, which can be rather confusing when proof reading.

Quill also allows documents to flow onto storage medium, (microdrive cartridge or disk) when you fill the memory, which means documents can be as big as you like, with the only limit being that you have to have enough space on the medium to save the entire document on it.

It can be used for typing short letters, or even books, although for the latter task, it would be wise to have an expanded machine with disc drives and more memory, as the program would operate far more efficiently.

Abacus is an extremely useful package that can be used for forecasting and keeping financial records, or many other uses with some imagination. It works on the principal of a grid of rows and columns, and calculations can be stored in these boxes, and work on the results of other boxes. This means that figures can be typed in, and the entire set of results will change. It can be done manually, but by using a spreadsheet, the job can be done hundreds of times quicker.

For example, cash flow forecasts can be designed, and figures altered to simulate various circumstances, and the projected results re-calculated at once. Another use is to store such items as price lists. A change in one trade discount would affect all prices requiring much work, but with the data stored on spreadsheets, new lists can be calculated and printed immediately.

The database manager is a program that requires a whole book to do it justice and there are several available. It is a program that will allow you to set up a simple card index of records at the simplest level, and program your complete stock control system using a number of files, and complex screen displays, when used more elaborately.

The last Psion package, Easel, is an advanced, and very easy to use package that will use either data straight from the keyboard, or from the other packages. For example you could create a graph with the sales figures from a spreadsheet in Abacus, or simply type in projected savings in your heating costs, for loft insulation, to produce a good graph to convince your bank. It will do graphs and pie charts of various types, and then print them.

All the packages except Easel will print on almost any printer that will connect to the QL, and many controls can be set to get the best out of it. Easel requires either a dot matrix or a plotter to print out the graphics.

One of the other applications that most users would anticipate buying at some point, is a spelling checker. It stops won fram tipping sylly septling mistakes, either by going through the document after you have typed it, or

Write to Reply

Dear S.U.B.,

I am a member of another user group for the QL, and I am not sure what the advantage of joining S.U.B. as well is.

SUB: The advantage is that we are a full time commercial support service. We are here 5 days a week, during office hours, and you can contact us at any time, and we will do our best to solve your problem straight away. Help and advice, even on highly technical subjects are usually free. We can also offer members special commercial benefits that are impossible from any other group. We are QL specialists, and we rely on QLs for our business, so we have first hand experience of using them for many applications.

I use my QL in my business, but I am not sure whether any of the services that business membership offers extra will be of any use to me. Do I need business membership?

SUB: The advantages of Business membership may not be necessary for you. If you have a particular requirement for your business use of the machine, then we may be able to arrange something for you. However, if our personal subscription includes your requirements, then there is no need to pay for a business subscription.

I am a new user of the QL, and I have not got much knowledge of computers, or the programs that run on them. Is there a limit to the support that I get in a year?

SUB: No, you can contact us as often as you need. We will gladly provide you with advice on any aspect of using your QL. You will have received information with this magazine as how to contact us for help and advice, at this time.

I am thinking about expanding my machine, but I have looked at the plethora of interfaces and systems, and I need some advice, and possibly a recommendation.

SUB: We can advise you on how to choose what is most useful for your particular requirements. We do not usually recommend any particular system, as we prefer to supply you with all the necessary information, and allow you to decide what items fit your planned expenditure best. We can advise at every stage, and can supply a complete system, already configured for your needs, should you so desire. Naturally, our advice does not commit you to buy from us, as we offer standard items. However, members receive a significant discount from us when buying goods.

Your chance to have a word about anything that you feel strongly about, and see your name in print. It will not be a catalogue of all your letters, rather a representative sample

Send all your correspondence to our normal address, but mark it "RIGHT TO REPLY." We will not process such letters in the normal manner, so your correspondence should be sent to "MANUAL RESPONSE" if you have a specific problem that you want solving. More details of how to get help is available in the appropriate section of the magazine.

If you want to write in about adventures, programming tips, useful shortcuts, features or packages that you have, or hardware ideas, then you can write in to "RIGHT TO REPLY" but we may not necessarily be able to print the letter, as only limited space is available. If you would like to see us devote space to a particular project, such as adventure game or users' interaction on programming and or hardware projects, then please let us know. We may be able to devote some space to it.

If you want contacts from the adventurers scene, or you have something to sell, then you will need to write in to our sales and wants section, "READER EXCHANGE."

If you wish to right concerning a problem with a trader, then we will do our best to sort out the problem, and we will not print the letter unless we have already tried, and failed to get a written reply from the trader ourselves. The matter will remain between the two parties concerned.

The response to this section of the magazine will determine its future. If you want to see readers get more say, then write to us, and make sure you have the "RIGHT TO REPLY."

PUBLISHING "QL S.U.B."

AN INSIGHT INTO THE MAKING OF A TYPICAL ISSUE OF THIS MAGAZINE.

With rising interest among users of all machines in using their systems for desktop publishing, we thought that you might be interested in some details about how we produce each issue of "QL S.U.B." magazine, using QL hardware and software for the entire job, from writing the text, to printing out the camera ready copy, for sending to the printers.

By the time you read this, the exact use of the system may have changed somewhat, as we are planning a number of developments. At present, we use a network of QLs, each with 640k, and attached to a printer. However, we are considering adding a 20mb hard disc to one machine, linking it to two of the printers, and using it as a dedicated file server.

QLS INTEGRATE THE CREATION

We use the QL systems that we have installed for every aspect of our business, as has already been outlined in the introduction. We do not use the machines simply because we feel that we should, but because by doing so, we can integrate every aspect of our business, from desktop publishing, programming, database management, graphics and illustrations, to financial planning, and accounting.

By using all QL packages therefore, we can include text from Quill, figures from Abacus, database information from Archive, graphs from Easel, and even programs from SuperBASIC, in a page designed with one of the three QL desktop publishing packages we have at present, and print it out on a printer attached to the QL, ready for printing as part of "QL S.U.B.", (should we wish to) without any problems of file incompatibilities, or having to send information from one computer to another. Then finally, we can get on with writing something for the next page, or issue, while the page prints out, memory permitting, of course! The beauty of using a versatile multi-tasking machine such as the QL.

DEVELOPING A QL DTP SYSTEM

Since creating the first edition of this magazine, the introductory copy, we have started to use a new program, and some of the content of this issue is produced with it. The format of future issues, and the quality may change considerably. We have also been investigating the possibility of using laser printers for our printout, which would speed up that process in theory, by up to several hundred percent.

That would mean that we could put all our applications on the hard disc, and leave the floppies on each machine free for a couple of data discs, and simply pass the pages and other printouts to the file server, which with a large memory, and using RAM as printer buffers, could take the time needed to do all the printing, leaving the original QL to run the application in use at full processing speed.

THE COMPLETE QL SYSTEM USED

The machine that we use for desktop publishing, is a 640k machine with twin discs, Sinclair Vision QL monitor and a Sinclair QL printer, as total compatibility was our first concern. (The Sinclair QL printer was a badged Seikosha SPI000 printer, and for some reason was almost completely omitted when it came to Sinclair advertising.)

The advantage of having machines linked on the network, to us, is that all the resources can be shared, but are totally independent. Even if one QL crashed, then all the others are unaffected, but each user can still access printers, for example on other machines, if their own is busy.

A RANGE OF SOFTWARE FOR NOW

Now back to the subject of the desktop publishing. The software we are using at present is not just one package, so there are no easy statements such as "buy this package" and you can produce quality output the same as ours. Each of the packages we use is good at a particular one of producing pages, and the three present standards complement each other well, in that each is good at something the others don't do very well. Rather annoying really...

by checking your spelling as you type. The second type requires extra memory, as it must store a large dictionary in memory to check your words against.

The first type will produce another file that you load into your word-processor again, which has words that the program cannot find a match for, either signalled as being wrong, or replaced with another word from the dictionary. The exact operation will depend upon the program you buy. The second type checks in realtime, (as you type), and will beep or highlight wrong words, and display lists of the words that match what you have already typed, if you get stuck at some point.

"Front Ends" are programs that are designed to take over the hassle of copying files from one cartridge/disc to another, making security copies, looking for that file you gave a silly name, and providing useful extras that would normally mean using either some complex QDOS commands from SuperBASIC, or loading another program. The range is quite staggering, and everyone has their own idea of what is ideal.

Some programs will work on standard machines, some will only work on expanded machines, with disc drives, with a mouse, or with problems. If you have one of the last type, then do not despair, try another, as the programs now available are far more advanced. Some programs have taken a graphical approach, and try to copy the display of other machines with a WIMP system, and some are based around text. One will almost certainly be just right.

Multi-tasking control programs enable users with expanded machines to run more than one program without any of the problems that can occur. Some programs (including the Pstion ones) will try to grab all the memory, and some will try to hog devices such as printer and microdrives/disks. The use of such programs ensure that these problems are overcome, and may also ensure that screen displays are saved and redisplayed when switching between choices. Some may even allow programs to carry on running, but ensure that they cannot interfere with any other programs by displaying screen text.

Utilities are programs that let you do things that ordinary programs don't. You may be able to get back that vital file you accidentally deleted, copy only the files you have produced since ten thirty this morning, or make programs that are supplied only on microdrive, run from a disk drive.

Toolkits are programs that provide you with a whole new range of commands, either for a specific area, for example a graphic toolkit including commands to reverse the screen, save sections of it, magnify it, rotate it, and move space ships around on it.

Other examples may be general toolkits which add commands to do conversions of numbers, check for errors, do special file handling, and control the programs running on the machine. Many of the toolkits available add hundreds of commands to the machine, some of which are very specialised, and you may never use many of them.

The QL has an excellent range of programming languages available. There is the standard version of SuperBASIC, and a number of compilers that turn your programs into extremely fast code that will multi-task like professional packages. There are also a number of versions of Pascal, Fortran, and C, and BCPL, Lisp, and APL, with versions of MicroPROLOG, and others coming. It is partly due to these languages that the QL has such a professional image. Most conform to standards, and have some extensions to make full use of the special features of the QL system.

In the business section of the market, there are a whole variety of programs from basic book-keeping to accounts packages with fully integrated stock control and invoicing systems. To now cover the business market in one small section would be insulting to those who have invested in such systems. We expect to run a series in the future.

The QL is well supplied with desktop publishing packages, and although it is not a natural choice at first glance, the packages can produce output that is up to the standard of commercial packages many times the price on other machines, and do QL systems justice for what they are.

As we do so much desktop publishing, the quality of our output is, we hope, rising over a period of months as we find the best methods available with each package, and we will be running a series on QL desktop publishing.

Another type of program available for any machine is for communications. The QL was cursed with a bad start in this area, in that the company asked to design official modem ran into finance problems, along with a number of other companies who planned rival QL modems. When it finally appeared, the software for the official system was less than brilliant, being rather limiting, and steadfastly refusing to multi-task which has been frustrating. Now, at least, the QL has some good terminal packages for the modems designed for it, and there is a bulletin board package available. For more on comms look under "PROTOCOL CONVERTER"!

Of course, the many programs that we have not mentioned are games. If you are interested, then most of the games you see on other micros are available in some form. Some said a machine with such hi-res graphics could not hope to run fast games- they were wrong.

SYSTEM VARIABLES

Hardware is the physical portion of a computer system, the electrical, and electronic components, the devices and circuits of the computer, and all the devices such as disc drives, printers, and monitors attached to it. In the easiest possible terms, it is anything you can actually pick up.

Hardware varies in function and design according to its purpose, although there are a number of common standards that make connecting hardware from different manufacturers more easy, and connecting different equipment all intended for use on the same computer system more easy. We shall discuss the different standards applicable to the QL, and outline what the different types of interface that are available, do, and their advantages and disadvantages on your QL system.

An interface is a common boundary between two systems, either hardware or software. Here we will be talking about the pieces of hardware that can be plugged into the QL, and allow the QL to communicate with other devices that use a different system. The QL has a number built in for common purposes, but further options of communicating with other devices may be added quite easily.

Hardware for the Future

In future months, we shall be doing reviews of existing interfaces, as well as the latest new releases for the QL, and compatible machines. We shall be carrying details of the software they use, and the ease of use from your existing system. The QL is designed in such a way that almost any piece of hardware can be attached to the QL, and be provided with software on the board to allow easy integration into the QL system.

The main problem now with the range of QL expansions is that there are few adequate expansion units to allow more than one interface to be plugged into the QL at a time. There have been a number of methods of getting round this problem, the most ambitious now resulting a number of interfaces being combined onto one expansion board, new housings complete with new keyboards, and incorporating more room for hardware expansion, and even in entirely new machines being designed.

When Sinclair launched the QL, they announced that they would be providing a number of interfaces for the QL, and that other non-standard interfaces would be made available through other companies, with or without the badged

approval of Sinclair themselves. The interfaces that they pledged to offer were a cheap 512k expansion card, an analogue to digital converter, a hard disc (@inchester) interface, a modem, a parallel printer interface, and an IEEE-488 interface.

The final thing that they promised, but never actually quoted a price on, or developed beyond the design stage was the real power of the QL hardware design. That was a 16 slot expansion unit, complete with its own power supply, and a design that would allow allsorts of expansions— even other processors could be plugged in.

The resident QL operating system software, works on the principle that any new interface plugged in can have up to 16k allocated to it for its control software, that is automatically linked into the entire system, and becomes as easy to use as all the existing items. To have 16 interfaces plugged into the QL, each with its own ROM takes the QL up to its maximum total memory limit of 1024k, or a megabyte.

Although the QL is a mature machine, and it already has a very respectable list of interfaces, there is still constant development, and several new interfaces for different applications have been designed, even though not all of them have gone from prototype stage to production. With the strong resurgence in the fortunes of the QL of recent months, the QL and its compatibles have a future that offers promising new developments.

The Standard hardware

First we will discuss the hardware, and the interfaces that are present on standard QL, what they do, and why we might want an expansion of some type.

(The accompanying illustration of the QL in the centre pages of the magazine may help to explain the sockets on the back of the machine better than the manual, where a full explanation is also made, perhaps less clearly.)

The QL was well received at launch partly because of its large number of interfaces, and the potential scope for expansion. The QL offers as video outputs to a Television, both mono and colour monitors, two joystick ports, two serial ports (RS-232Cs, one set up for a printer, and the other for a modem), two simple network sockets to allow inter QL communication, a socket for plugging in further microdrives, a slot for plugging in a ROM cartridge,

The QL may have a new system for desktop publishing eventually, and we will be using that, no doubt too, but at present, "Desktop Publisher", and "Desktop Publisher Special Edition" from Digital Precision, "Front Page Extra", and "Front Page Extra 2" from Gap software, and the newcomer, "Page Designer 2" from Sector Software each has facilities to make production of "QL S.U.B." easier and better. We thank the authors of these programs for their efforts and assistance. If we ever get the time, we are going to finish our own desktop publisher, then you will really see us produce output.

WRITING TEXT FOR "QL S.U.B."

We write the text using Quill, my own personal preference for wordprocessing on the QL at this time. We do have a couple of alterations to the standard version, having it "fitted" with the TurboQuill plus program from Athene Consultants, and the addition of the remarkable text screen accelerator, SpeedScreen from Creative Codeworks. These two programs in conjunction with a true multi-tasking environment, and a real-time, (check it as you type it) spelling checker, make the use of the Psion packages surpass even the full Psion "Exchange" suite which the QL packages are a reduced version of, for power and ease of use. (There is more information about the Psion packages elsewhere in this issue.)

Having written the text in Quill, using a special size of page, set to match the size of the column we want to place the text in, it can be imported into the appropriate program and the page can be created. Spaces for headings, illustrations, and any photographs are left in the text, by leaving a number of blank lines. That may sound troublesome, but it is a lot easier than messing about with the size and position of columns later. When all the text has been laid out on the page, the comments, headings, screendumps, drawings, or whatever, can be included where required.

PRINTING OUR FINAL VERSION...

When all the computer generated parts of the page are finished, it can be printed out. Normally we use two passes, as on DP "Desktop Publisher", this can take well over an hour—so you can imagine that with forty pages per issue, we have been very busy, and the printer is starting to feel tired.

Really all the programs need an Epson compatible printer, that can pretend to be an Epson FX-80. If your printer is very non standard, then the way that the programs use the printers will ensure that you can't use it. Of course, if you have a daisywheel, then you can't even hope to get a printout!

Photographs planned for, when the page was first designed can be glued onto the page after it is printed out, and the page, almost finished at last, is then put on the pile of finished pages. When all the pages are there, and we have the finished magazine, we add the page numbers—we do not print those onto the page earlier in case a new item appears that will change the face of QL computing, or we want to include a special offer for readers. If that happens, then we can simply reorganise the page order to suit.

PRINTING YOUR COPIES AT LAST!

When we have a full edition of the magazine, we send it off to the printers, who photo-reduce each page, using a camera, from the original A4 to the standard A5, and produce the "plates", the metal sheets that are used to print all the pages of the magazine. When we see the printer next we can pick up the required number of copies of the magazine, all ready folded and stapled, by hand. The final result, that which arrives through your door by post, is placed in envelopes, (already labelled with your name and address from the database system,) and posted, the same day.

Although it is not part of the magazine production, this is when we enclose information about special offers, price reductions and new services. If any of the sheets of information are missing from your copy, then simply give us a ring, and we will get copies off to you. We also produce the leaflets on the desktop publishers, but they are photocopied.

THE PROBLEMS ALONG THE WAY

Producing the introductory copy of the magazine has proved to be far harder than we expected. The trial copies of the magazine that we designed never encountered any of the undocumented features (bugs) of the programs, and we found that even the printer had extra difficulties in production.

Future issues of the magazine will no doubt be better, as we will be using the desktop publishing programs in better ways, and achieving better results, and we may even be using better software, and better hardware, and we are learning all the time.

DO YOU WANT TO DO QL DTP TOO?

If you would like to discuss hardware and software with us, with a view to using desktop publishing systems on the QL, then we will be happy to pass on our experiences of it, to you. We can also supply all the packages, the hardware, (from the QL itself to the printers), and lots of helpful advice.

problem is that on machines as complex, and potentially powerful as the QL, programs have to be very complex, to take advantage of the facilities of the machine.

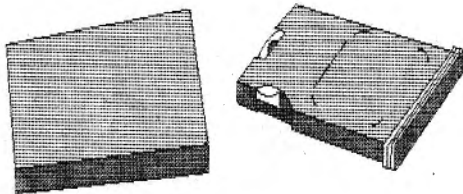
For the QL, the most useful first expansion for the machine is added memory, and 512k is the most common. (A number of programs will now only work on machines with at least 512k.)

Memory can be added to the QL in various different sizes, from 128k to 512k extra (as envisaged by Sinclair) or even by 768k by ignoring some of the original hardware rules set by Sinclair. There is only one problem with adding 768k—the entire memory space of the machine is full, and you cannot plug in other interfaces, or expansion ROMs for utilities etc., as well. In practice, this does not really matter, as few people ever buy more than one interface, and the card that provides 768k extra includes a disc interface as standard. Therefore the maximum RAM memory of a QL is 896k. The most popular expansion is 512k, taking the machine to 640k.

Memory may be either plugged in on an interface (a card), into the expansion slot, or fitted internally. There is an advantage in having an externally fitted expansion, in that if the unit uses fast memory chips, some programs may show a significant speed increase. Therefore it is well worth finding out whether a plug in interface will do this, if you are interested in speed. The other option is the internal RAM expansion—this has the advantage of leaving the expansion slot free for other interfaces, such as for discs.

Quantum Leap in power

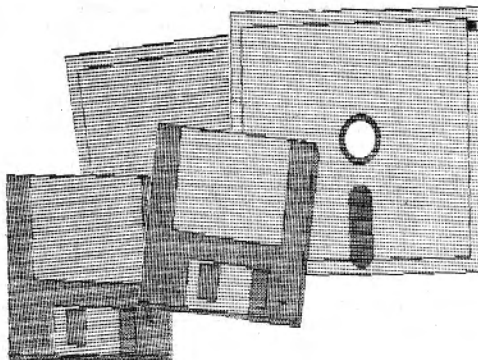
The second expansion that most people consider is the disc interface, and one or more disc drives. If you have ever suffered from unreliable microdrives, then you may already have considered buying disc drives.



They are an expensive upgrade to the QL, or any other microcomputer, but they push the machines performance into another league. Disc accesses with a modern disc drive are almost silent, and very fast, with almost instant access to the data needed. Any

part of the disc can be read at any time. With a tape medium, even the microdrives which use an endless loop of tape, you have to wait until the appropriate part of the tape comes round to the read head.

Disc drives on the QL conform to a set standard from Sinclair, that means that a disc written on a disc drive attached to a QL interface from one company can be read on a disc drive attached to a QL interface from another. Although you may choose to plug in either 3", 3.5", or 5.25" discs, the standard has become 3.5".



Most software that is provided on disc is supplied on the durable 3.5" discs. Each disc holds 720k, compared with 100k - 120k on a microdrive cartridge. Discs work out a lot cheaper, and far more convenient, if you have a lot of information (or text) to store.

The commands that you know about for microdrives work on discs exactly the same, except that you refer to flp or fdk (different systems use different names) instead of to mdv in filenames.

You can still use all your software on microdrive, and you can easily copy most programs from microdrive to disc. You may have to tell the program to look on the floppy disc instead on the microdrive, but most programs have instructions on converting programs for discs, and we will help, or can configure it for you. Many programs are supplied on disc, and some of the new programs will only work from disc. We use disc drives because each page of this magazine takes around 100k! So for 40 pages, that's 40 cartridges, or almost 6 discs. For 12 issues that is 480 cartridges, or 72 discs! (+ text!)

About the only exception to the ease of copying programs onto disc are games. Some games check a code on the original microdrive, or use microdrive in a special way, and will not run from disc. (You can use as before.)

and an expansion port with all the necessary connections to allow designers to add almost anything to the standard design of the machine.

Getting a clearer picture

The television output is standard. There are standard connections for attaching composite video, and RGB monitors. Many modern TV/Monitors offer these connections, but the connections vary to such a degree that to offer advice here on connections would be impractical. (Any TV repair centre should be able to help, but if not then contact us with details.)

The joystick ports offer the standard controls, but a non-standard connector that requires either an adaptor to convert from the standard Atari connection on most joysticks, or a joystick with a special lead. The first acts the same as the cursor keys, and fire is the same as SPACE. The second port acts the same as the function keys if plugged in.

The two serial ports offer standard RS-232C ports. The problem is that the RS-232C is a standard that is so loosely defined that it varies so much as to make connecting anything to it very difficult. (The connectors are also unusual.) Many printers use a parallel (centronics) connection, which uses a ribbon cable usually, but there are many printers that have a serial, RS-232 connection. With a QL standard lead, most should work first time. There are various controls that may be required, such as the speed of transmission, and error checking. (We can help if you get stuck.)

The second serial port is designed for a modem, having slightly different connections. The only problem is that it can only send and receive data at the same speed, and a lot of services such as Prestel require data to be sent a lot slower than it is received. QL modems are specially designed to allow this type of transmission, and there is also a special adaptor to allow connection to any standard modem or computer for use as a terminal.

The network ports are present to allow up to 64 QL (and Spectrum) computers to communicate with each other using the cables provided. The link with the Spectrum was originally designed with a view to linking QLs with existing Spectrums in schools. The link with Spectrums is rather unreliable, but possible, however. The basic system for the network is rather simple, but can be upgraded to allow sophisticated features such as sharing printers, disc drives, files, and even screens. In this form it rivals expensive systems for other computer systems.

There is a connection for plugging in

up to 6 other microdrive units, although the expansion microdrives never became available. With care, and some ingenuity, Spectrum microdrives can be attached. No more than 5 should really be attached, or problems ensue.

The ROM cartridge slot allows you to plug in cartridges containing programs or extensions to QDOS on ROM, each of which can be up to 16k in size. (The power must be disconnected while doing so.) This allows toolkits, control programs, and other items to be made available without taking up the RAM on a standard 128k QL, a useful feature.

Scope for Expansion

The expansion port carries all the necessary signals for connecting almost anything to the QL. The following part of the article is concerned with the pieces of hardware, interfaces, that can be plugged in to this port. (It is concealed behind a plastic cover just under the left of the machine, and anything must be plugged in while the power is off.) As we have already stated, this was first intended only as the connection to the expansion unit, into which further interfaces could be plugged.

Memory, the 1st addition

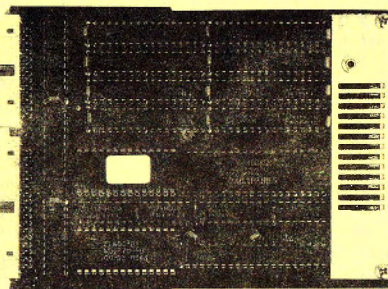
Now to discuss the extra interfaces available. We will not be referring to any particular manufacturer as the items available may vary, be updated, or discontinued. We shall, however, discuss all the hardware options that are available at the present time, and the possibility of the appearance of other interfaces that may be available by the time you read this publication.

The first expansion and possibly most useful expansion for the machine is a RAM expansion. The area of RAM upgrade for the QL is somewhat complicated, so we shall cover that first. Compared with other machines in the market when it was launched, the QL had an enormous amount of memory.

When the Spectrum could run a full word processor in 48k, and still have 30k of memory free for text, many people were surprised to find that the QL with 128k, when running Quill, the free wordprocessor about which so many claims were made, only had enough room for a few pages of text in memory, before it had to juggle it on and off the microdrives slowly and unreliably. When you add a disc interface to an unexpanded QL, you cannot even use Quill at all, because disc drives take 1.5k, which leaves insufficient memory free for it to run in.

Some people say that if you give a programmer more memory, he will make a program expand to fill it. The real

The only basic sound synthesiser for the QL is also equipped with a good parallel printer port, and plugs into the expansion port. Originally the QL was to have just such a combination produced, and it is interesting to hear the QL playing away beautifully. The unit includes comprehensive sound and music generating commands on ROM, and so programming it from SuperBASIC is quite easy, though takes practice. The unit is on a short card designed to be concealed inside the QL case.



Music to your ears. MIDI

Although not available at the time of writing, a new midi interface for the expanded QL is planned, and will almost certainly be available by the time you read this. The unit requires fast expansion RAM, so an internal RAM expansion will not work. This is because the unit requires very accurate timing to communicate with a second processor for the midi control. A comprehensive software package to write and play music is in development and will be available at the same time as the midi unit becomes available.

The midi unit on its own is useless, as you require either a midi musical instrument on which to play the music you have composed, or both the musical instrument and a keyboard to put a QL midi system together. We can usually supply a range of suitable items—please enquire for details on what we have at present, and on QL systems.

Speech synthesis an option

If you would prefer to hear you QL speak to you, rather than play to you, then you may be interested in one of the speech synthesisers available for the QL. There have been a number for the QL, but one type seems to be more dominant at present. The two types of speech synthesiser are on an expansion card, and in a little black box connected to the QL via the serial port. The latter seems to be more popular, and the first type may not continue to be available.

Software provided on ROM, or on disc or microdrive is used to translate any text printed to the device, into rough spoken english, using a set of very complex rules. The design of the chip means that not just a limited range of words can be spoken, but theoretically any word in any language. It is even possible to add intonation to words and sentences, and theoretically to make the QL sing! The software on one package will make the QL audibly list programs and files by voice rather than text. A novel feature indeed!

There have been very significant developments in the quality of QL interfaces since the first one were made available for the QL. The present QL range of interfaces are smaller and faster than those previously produced, and there have been several multiple interfaces produced for the QL. These are among the most advanced of their type, as they use the most compact, and coolest circuitry, and have to work within smaller tolerances.

The ultimate expansions

The two present market leaders in the multiple interface range are from two rival companies, and they have chosen to take a different point of view in the design of the interface.

The Super Qboard offers a basic unit with a disc interface, a 32K ROM containing Super Toolkit 2, the disc driver, and the options of 512K to expand the QL to 640K. There is also an optional mouse interface, and mouse with the driver software on ROM. Theoretically, the card will take up to 128k ROM.

The Trump Card offers a basic unit with a disc interface, a 32k ROM containing Super Toolkit 2, the disc driver, and 768K of RAM, to expand the QL to 896K. That expands the machine to its maximum capacity.

Peripherals and extras

There are some other interfaces that are not quite so obvious. There are interfaces which come with IBM style keyboards to enable them to be used with the QL. There are a variety of them available, offering different features. Most simply plug inside the QL, but some require some soldering. There are also mouse ports designed for a variety of connections, from the units which plug into the ROM port, to ones which plug inside the QL. There are battery back-ups for the clock which ensure that the time will remain set even when the power is off.

The QL hardware scene has not finished developing. New interfaces are planned and will give the QL even more power.

Other Interfaces at work

The ultimate leap in power for the QL user upgrading from microdrives, would be a hard disc drive, and the special interface needed. That is a drive that is very much faster, and stores many times as much data, usually 20MB, that is 20 million characters. It can also access data almost as fast as RAM, and so it offers superb performance.

The only problems is that the disc is fixed in the drive, and when it is full you have to buy another drive, or erase some of the files on the first. It is unlikely that anyone using the microdrives at present would require a hard disc drive. If you are using floppy discs, and you are having to split up files, or data between discs, the maybe it is worth considering. We are considering buying hard disc drives to store all our programs on, so that we can use the floppies purely for data. Hard disc drives are usually a very costly acquisition costing you upwards of £700 pounds for a basic 20MB drive and a suitable interface.

Getting your QL printing

A parallel printer port will allow you to plug a standard centronics printer into your QL. These interfaces plug into the expansion port, and come with software that lets you refer to them as 'par', as opposed to the 'ser' of the standard serial ports. They are very uncommon now, as the other option (next) is usually preferred. One of the interfaces on the market at present has a parallel port on it, as well as a RAM card, and mouse port.

A serial to parallel converted plugs into the serial port of the QL. The programs do not need to be set up specially, as the converter simply translates output to a serial printer into output suitable for a parallel printer. It is no more difficult to set up than plugging in a serial lead. This leaves the expansion port free, and should you need two printers, the unit will plug into ser1 or ser2, so a serial printer can be plugged into the other port, or even another converter!

Specialist interfaces OK

There are a number of other specialist interfaces available for the QL, each of which offers superb performance, and ensure that the QL has a large number of specialist users. Some of them are produced in the standard card format of the QL, but some, due to special requirements, make use of the ROM port on the back of the machine, or are fitted internally on the QL, or on certain expansion units available. In the absence of expansion units, this is an advantage to consider.



There is only one EPROM programmer for the QL that connects to the expansion port. Another was available, but as this would appear to have been phased out, we feel that to discuss this particularly superb unit by name is not showing any particular bias.

It is called QEP-III. It is housed on a standard QL expansion card, with a single zero-insertion force socket on the end of the unit. It offers the QL user a completely menu driven system for programming EPROMs, and will blow a wide range of chips, at various speeds, and provides advanced features such as on screen diagrams off all the chip types, and the facility to swap certain lines around, to simplify circuit board layout, where possible. It will also read and analyse EPROMs, and blow code from RAM, or any file device such as microdrive or disc. It offers numerous facilities that make it outperform similar equipment many times the price for other machines.

Scientific control all set

Another interface with no competition on the QL is called the Q448 interface and offers an industry standard IEEE 488 Instrument Bus. This particularly specialised interface was developed with industry experts, and offers all the features necessary from SuperBASIC or any other language conveniently.

Digitise your QL friends

Ensuring that the QL can compete with other machines on graphics, the QL has an inexpensive video digitiser which will create QL screen graphics from either a video, or video camera, in 8 shades, or colours. It plugs into the ROM port on the back of the machine, and comes with software to produce printouts in a number of shades of grey, and can be tuned to the image.

From BASIC beep onward

The QL has fairly basic sound as standard. It is similar to that found on the Spectrum, but the QLs second processor ensures that the sound does not slow up the machine. However, the sound is only single channel, and it hardly offers any scope for the more imaginative user to express their musical talents. Fortunately, there are a couple of solutions to this problem, and we can help here too.

Accessing Prestel and Telecom Gold Bulletin boards, and our "S.U.B."

Once in Prestel, (which displays text and graphics on 40 columns in up to 8 colours, in the same UIENDATA format as Teletext, the data transmitted with your television signal and decoded by a teletext TU/Receiver) you have access to up to 350 thousand pages of information, each of up to several screens, and each available almost instantly. (Far faster than Teletext.) There are pages for the QL, called Qnet2, with news and reviews, and an area called Gallery where you can set up your own database for 99p a page, a quarter, then 1p a page an update. We hope to have a section on gallery- we may have it as you read this.

Most pages are free, but if you want to buy software, read share details, or other specialised information, you may be charged accordingly. The cost of all the frames accessed is added to your quarterly bill from Prestel. Your access to Prestel from 6pm to 8am is free. If you access Prestel during business hours, then you are charged 6p a minute all the time you are logged on, and that is extra to the phone bill. The bill from Prestel is entirely separate to that from British Telecom for the use of your phone. Calls to Prestel are at a low local call rate, (which is really very low- being around 50p at present for an hour) but you may find that your bill rises quite a lot because you access Prestel more as it grows on you...

Telecom Gold is a service from BT that is aimed at business. It allows you to send and receive mail to a large number of organisations with accounts, and to do various editing and special processing of your mail. The charges are being altered at the time of writing, and you should expect to be charged for every 500 or so characters you send, and for storage of text. You also pay an access time charge, and the usual phone bill. The advantages of the service are limited to personal users, but to business are superb. You can even send text to a typesetting bureau now, and receive it the next morning already done, ready to print.

We will be covering both Prestel and Telecom Gold and similar services in future issue of "QL S.U.B." magazine.

Electronic Mail, its applications

The advantages of Electronic mail are that it arrives virtually instantly. It is available as soon as the person or company to whom it is addressed next accesses the computer to read it. You can also send and receive telexes using the service, (we do) and send out mailshots to all likely customers. It is the mail system of the future.

A bulletin board is like a meeting place for modem users with particular common interests such as computing, science fiction, electronics.... The system is usually run by an individual on a microcomputer, and will consist of a number of menus leading to the various areas of information according to the operation of the system. There may be facilities for leaving messages for other users, downloading (that is copying down the phone line from the bulletin board to the user's computer) programs, and files of interest, and chatting to the sysop. (Jargon meaning the person who runs the system.) Each system will have particular features:

Our plans for Super User Board are in early stages at present, as we have been developing a bulletin board package from nothing, but we are now looking at using one from another source. It will definitely be run on a QL, and it will operate 7 days a week, during the evening and night. It will offer a number of features including different privilege levels.

This will mean that anyone will be able to access some of the information (Level 1), people who pay a small fee towards the costs of running the board will be able to access a higher level (Level 2a), and members of Super User Bureau will be able to access another higher level (Level 2b), whilst those people who are members of both the club, and the board, will be able to access all the features of the board.

Quite how things will be arranged is not yet finalised, but at the highest level, you will be able to ask for help on-line, and get replies on the database, or confirmed in writing, and read articles from the latest issues of "QL S.U.B." possibly even before their publication. You will also be able to download software completely without charge, and order goods from our extensive catalogue, using your credit card, on-line, at any time. (The latter will become available as soon as it is possible to offer you credit card sales- enquire please.)

The service will offer news, reviews, and letters pages, as well as all the messaging facilities you expect; the hierarchical access rights already described, and a large number of titles from our rapidly growing public domain software library, including both QDOS, and CP/M programs.

We shall distribute more information to all interested parties as soon as we can. Please register your interest with us, as the more interest is shown the more services we can offer to you. The charge mentioned will be nominal, and will be less to members of course.

PROTOCOL CONVERTER

Communications, and all it entails for you, and us!

As soon as the word communications is mentioned lots of people start to get excited. People who have never used communications on a computer, but have read newspaper reports, may think that it is all hacking, accessing secret bank accounts, and private passwords. People who have used a modem, and have accessed services such as Prestel, or a large bulletin board start to think of the convenience of electronic mail, and the advantages of having access to a large amount of up to date information, quickly and inexpensively.

Communications of various types

Communications are split into various different areas. There is simply the linking of machines on networks, such as using your QL as a terminal to the local college computer system, or to your company's mainframe system. You may wish to link your QL with your PC at work or home, to transfer files for example. The last, and most common use of communications that we will discuss here, is to access remote bulletin boards, and databases such as Prestel and Telecom Gold, to peruse their data or send and receive electronic mail.

Linking a QL to other computers

Linking a QL to other computers need not necessarily require any special hardware or software. If the computer is sending and receiving information at the same speed, and it is does not need to display special text formats, then a simple terminal program and an serial lead between the two may do.

However, for more complex tasks, or if your machine is going to be used as a common terminal such as VTS2, then you may need special software, and an intelligent buffered communications unit. The latter will ensure that no characters sent or received are lost, and that you can send and receive at the same time, at different speeds.

You may also require special software, such as XMODEM, to send and receive file in such a way that checks that the file is not being corrupted in any part of the transmission process.

If you simply want to transfer files to and from an IBM PC, for example, then it may be easier to buy a package tailored to that task, or if you have the same size of disc on each machine, then a suitable file transfer program may do the task more easily, and more economically. (Ask us for advice.)

Connecting computers in the same room, or the same building is fine, but what if the computer you want to send files to is 200 miles away, or in Australia? Connecting cables could cause problems - the phone lines are the solution, but you need hardware to convert the codes from numbers into sounds to send them, and then do the opposite again, on receiving them. A modem does this job.

Different speeds can be used, the rule being the higher the speed, the higher the cost. For most communications at present, commercial services use 1200 baud transmit, 75 baud receive, and most small systems run by amateurs use 300 baud both ways. The Baud rate is divided by ten to give a rough idea of how many characters a second are sent.

There are a number of modems designed for the QL. One point is that it is illegal to plug in a modem, like it is with a phone, unless it is approved by British Telecom - has a green sticker on it. You can be prosecuted for using unapproved modems if BT finds out.

It is not necessary to dial the computer you want to communicate with directly. You can use another computer system, and send information through that to the computer you want, if the other computer can also access a computer on the same international network. Costs are high, but are less than dialling the computer directly.

Prestel, Telecom Gold, and others

Commercial communication services such as Prestel, and Telecom Gold offer their customers a number of features that would be unobtainable otherwise. These two services grew from the needs of different business areas, and they take a different attitude to personal users. For most people, Prestel is the more interesting service, and with the addition of an area called Prestel Microcomputing, more commonly known as MICRONET, it offers excellent service.

Once registered for a quarterly fee, the user of Prestel/Micronet, can simply dial a local exchange, and be connected with one of a number of computers, possible in the same city, or at the other end of the country, all without any discernable difference in operation. When the Prestel system responds, the modem then takes the line, and starts to transmit and receive information. Access is limited by a personal identity, and password, both of which must be kept secret to prevent potential misuse by others.

| | |
|------------------|--|
| Concurrent | Programs on the QL can run concurrently, that is multi-task |
| Constant | A value that will remain the same, given a certain name |
| CP/M | Control Program for Microprocessors, an operating system |
| CPU | Central Processing Unit, see microprocessor |
| Crash | Term to describe what happens when the software fails |
| CRT | Cathode Ray Tube, the usual method of display, as in TVs |
| Data bus | The tracks along which data travels in a computer |
| Directory | The list of files stored on a particular medium |
| Disc Drive | A device to read/write to magnetic discs, for data storage |
| Down time | Period while a computer is inoperative due to failure |
| Download | To receive information from a host computer |
| Emulator | A program which makes a machine pretend to be another |
| EPROM | Erasable Programmable Read Only Memory, on which data can be burnt permanently, and erased with ultra violet light |
| Expansion cards | A circuit board containing additional hardware to plug in |
| Expert System | A program that uses existing knowledge to make decisions |
| Fanfold | Continuous computer paper with holes down the side, folded |
| Fields | Space for particular information only, such as telephone no |
| File | A collection of similar records, or the name of some data |
| File server | Program/device that does file handling for other computers |
| Firmware | Software supplied already permanently stored on a chip |
| Flowchart | A graphical representation of a sequence of actions |
| Format | To prepare a medium for use, or the organisation of data |
| Forth | Programming Language widely used in control applications |
| Fortran | Programming Language widely used in scientific applications |
| Friction feed | A mechanism on printers to feed in ordinary paper for use |
| Function keys | Special keys on a keyboard for use by application programs |
| Gigabyte | A storage unit, 1024 Mbytes, over 1000 million bytes |
| Glitch | A small voltage fluctuation that can crash computers |
| hardcopy | Printed copy of data stored on a computer system |
| Hardware | Anything physical, anything that can be picked up |
| Heatsink | A metal component used to disperse heat, and relieve chips |
| Hex | Base 16, a number system using characters 0123456789ABCDEF |
| IC | An Integrated Circuit, a chip |
| Icon | A small picture used to represent data, a device, or action |
| Interface | A device to connect two or more standard items together |
| Interrupts | Signals that cause a computer to do something different |
| Joystick | An input device to signal up/down/left/right/fire in games |
| K Kbyte | A storage unit, 1024 bytes, a QL has 128k RAM as standard |
| Keywords | Words reserved by a programming language to do set actions |
| Laser printer | A printer using similar technology to a laser printer |
| LED | Light Emitting Diode, usually used as power indicators |
| Linker | Program that combines program modules into single programs |
| LISP | List Processing, Language used for artificial intelligence |
| LOGO | A widely misunderstood language, taught in schools |
| Machine code | The set of instructions understood by the microprocessor |
| MB Mbyte | A storage unit, 1024 kbytes, over 1 million bytes |
| Menu | A display of options from which a selection can be made |
| Microfair | The most important show for the QL computer |
| Microprocessor | The chip which executes all the programs on the computer |
| Modem | Modulator/Demodulator, transmits/receives data over phone |
| Motherboard | Circuit board into which other (daughterboards) are plugged |
| Mouse | Desktop input device, often used to move a screen pointer |
| MS/DOS | An operating system used on IBM PCs and compatibles |
| Multi-task | To appear to run more than one independent program at once |
| Network | A number of machines linked together, able to communicate |
| Nybble | Half a byte, spelt with a y to sound technical |
| Object code | The code that a compiler/assembler produces as output |
| Octal | Base 8, a number system using characters 01234567 only |
| On-line | Being in contact with another computer using the phone |
| Operating System | The resident software to do housekeeping and control |

MANUAL RESPONSE

WE ANSWER A FEW OF THE MOST
COMMON PROBLEMS TO ARISE...

This issue is a kind of reference work to the general world of QL computing with the QL. This section is the help section, so we include here answers to some of the most commonly confusing terms, with an explanation of jargon.

Jargon is defined in my dictionary as being "confused talk". I would have said that it was the use of words that intended to confuse all but people who were conversant with the words used. Jargon is very unusual, as if you do not understand a normal word, you can usually guess at its meaning from the context it is used in. Jargon creates sentences where even guesses fail.

As there have been numerous requests for attempts to clear up some of this confusion, we have attempted here to explain the most commonly used terms. We have included the basics, as it is all too easy to think that they are well known, yet find that many people are trying to learn more from confused basics. Thus, we make no apologies for sounding slightly patronising to those of you who already know everything.

In future issues of this magazine, we may well be updating the jargon section as new terms become used, and if an article is specialised and requires explanation of terms used, then we will carry a small explanation of them at the start of the article. However, it is our intention, where

possible, to write without having to use jargon. It is simply that as one becomes accustomed to reading and using it, it becomes increasingly difficult to avoid using it.

You may well think that some of our explanations are too short, or not as good as you could have done! Our only defence is that there are entire books on the market to cover the subject should you want to know more. One we would recommend is by Osborne, and is called Computer Jargon. It may look just like a book for kids, as it is illustrated with little robots, but it goes from the most basic concepts up to an explanation of machine code instructions, and basic electronics.

Normal issues of the magazine will feature a number various different problems, although we may select a certain topic and attack it with a lot of information, if we feel that there is demand for such action.

Members are welcome to write in with their problems, and they will be dealt with as quickly as possible. Any extra comments made in the magazine, on some of the problems received, will be made after the solution has been solved. If you have made a breakthrough, and you think that readers would be interested in sharing in it, then by all means write in to tell us about it. We will try to print everything that is not a duplication of previous information.

If even we can't find a solution to your problem, and our trade friends can't, we will ask you, the readers for help. We will add all problems and solutions to our database on the QL, and so in time, we hope to have even more information to use to help you.

| | |
|-------------------|---|
| Address Bus | The tracks down which the memory location selection travel |
| Array | Like an invisible grid containing rows/columns of data |
| Assembler | Program to convert assembly language to machine code |
| Assembly language | Language of primitive mnemonics used to write machine code |
| Asynchronous | The transmission and receipt of data at different rates |
| Autoanswer | The ability of a modem to respond to an incoming call |
| Autodial | The ability of a modem to dial the number required |
| BASIC | Beginners All-purpose Symbolic Instruction Code, language |
| Band rate | The rate of transmission of data from computer to computer |
| Binary | Number base 2, uses only 0s and 1s to count with |
| Bit | A storage element, a single on or off signal |
| Boot file | The file the system tries to load at start up on any system |
| buffer | Area of RAM, or device, used to store transmitted data |
| Bug | A fault in the hardware or software which causes a problem |
| Byte | A storage unit, 8 bits, 1 character |
| CAD | Computer Aided Design, or cheaper Computer Aided drafting |
| CAM | Computer Aided Manufacture, used widely in industry |
| Electronics | Standard parallel interface widely fitted to printer |
| Channel | A path taken by data to flow to its destination |
| COBOL | Common Business Orientated Language, widely used as such |
| COMAL | Structured development of BASIC, very similar to SuperBASIC |
| Compiler | A program that converts source code to object code |
| Composite Video | Produces quality better than UHF TV, but worse than RGB |

Finest Hardcopy

The program featured in this intro copy of the magazine is on a QL theme. It is a relatively short(!) program, and is, we hope, easy to use.

The program is a useful little routine that can be included in your biggest and best programs, or simply for use in demos and loaders. It will compile, but surprisingly, there is not a very large speed increase- the program is slowed mainly by the use of complex graphic calculations, and the actual screen drawing of the QL. (That is not to say that QL graphic screen handling is not very fast already...)

The program is not perfect, and the author admits it. However, it does use SuperBASIC correctly, and does not do anything "naughty" or confusing. The whole routine is a procedure, and can easily be RENUMBERed, saved again, and merged into another program.

The only part of the program that is not usually necessary is the section of code from lines 100 to 250. The main routing is called "QL", and uses three other procedures, called "nkey", "skey", and "entkey", respectively. What follows is an explanation of the use of the procedures, and the numbers that should be sent to them.

QL window, size, xpos, ypos

-window is a screen or console device. The default output window for normal SuperBASIC programs is 1, and the default output for listings is 2. Either can be used, although it is better practice to open new unused ones, and then close them again after use. You can direct the output to any valid QL output device, including the net filing system, (more later).
Note: No hash is needed

-size is the horizontal size of the QL. The program assumes a scale of 256 but the best way to work out the size you want is by trial and error. The QL will be in proportion no matter what size you choose. It does not need to fit on the screen. If you choose a size that is too big, then only part of the machine will be visible...

-xpos and ypos are the horizontal and vertical positions in graphic coordinates. For example if you decide to position the QL at position 10 across and 10 up, then they are type 10,10. The position does not have to be on the screen. You can easily position the machine off the screen, or show different parts of it according to what you want to do.

Explanation of program as listed:
(Naturally, REMarks have been omitted)
110 output=3
This line sets the output channel, but

is only for clarity. You can use any number, or direct the QL to different screens which you already know the numbers of, as used in your programs.
120 MODE 4

There is no need to run the program in mode 4. (However, it is clearer in 4.)
140 OPEN#output,scr_512x202a0x0
This line opens the output channel to the screen. It is designed for a monitor, but can be adjusted for a TV, by typing scr_448x200a32x16 instead of the present text.

(If you have two QLs, and each has an extended network driver as supplied on Qjump Super Toolkit 2, then type in fserve on each QL, and type nl_scr_ and the appropriate tv or monitor size of screen extension. You will see the QL being drawn on the screen of the other QL- that is, the one not running the program. If you have 2 QLs, and would like to know more, contact us.)

150 PAPER#output,2,0,3: cls#output
Sets the paper- in this case dark red
160 BORDER#output,1,7,0
Sets the border- in this case grey
190 QL output,70,75,75
200 QL output,125,50,50
210 QL output,250,5,5

Draw three QLs of varying sizes- the QL procedure blots out the graphics or text underneath it by using fill.

230 CLOSE#output
Good housekeeping practice- closes the output channel after use. Do not direct the QL to channel zero, and then close it- you will be locked out for good, unable to type anything in.
Note: If you are using GRAM or POINTER then note that when you close the channel, the output outside the predefined windows of SuperBASIC will disappear. (Spectacular on the Net!)
Insert a PAUSE at line 225 to stop it.

I am working on a new version of the program that will draw out the machine on any angle, and any position, which will really look excellent. I have not included any keyboard characters- it was hard enough drawing the keyboard to scale, let alone drawing letters on it. If anyone is so masochistic as to program the characters too, then send us a version in for the library!

I have not included any explanation of the actual procedures here. If you want to delve into the code you can, but the routine was written to be used rather than modified extensively. It uses local variables within the QL procedure, but calling the key drawing routines from outside the QL procedure will cause problems, as a couple of the variables are local to the QL procedure, and procedures it calls.

Over the page is the program itself, imported straight into the desktop publisher, so there should be no lines missing, odd misprints, or mistakes... Some lines are split slightly because of wordwrap- type them as normal.

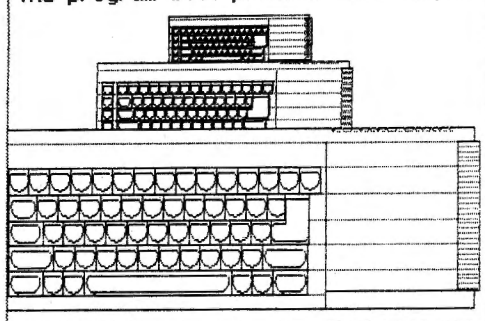
| | |
|-------------------|---|
| Paddle | Input device to signal turn, left/turn right/fire in games |
| Palette | The choice of colours from which to choose colours |
| Fan | To move the screen left or right as required |
| Parallel Int'face | A device that transmits bytes/characters in whole units |
| Pascal | A programming language widely used in education/business |
| PC | Personal Computer, designed for individual desktop use |
| PCB | Printed Circuit Board, a base on which components are fixed |
| Peripheral | Any separate device that plugs in using an interface |
| Pixel | Picture Element, the smallest dot displayed on the screen |
| Plotter | A device to draw lines on paper under computer control |
| Pointer | An onscreen marker to indicate the present selection |
| Port | A socket to plug a particular type of connector into |
| Prestel | Computer based information service from British Telecom |
| Procedure | section of code in a program that can be called by name |
| Processor | The microprocessor in micros, that which executes programs |
| Program | Instructions that determine the actions of a computer |
| Prolog | Programming language used for artificial intelligence |
| FROM | permanently- often used while ROMS are manufactured |
| QDOS | Programmable Read Only Memory, on which data can be burnt |
| QLAN | The operating system implemented on the QL as standard |
| RAM | The network system as implemented on the QL as standard |
| Ram disc | Random Access Memory, read/write, loses data without power |
| Random Access | An area of memory used like a disc drive to contain files |
| Real-time | Facility to access any information directly from any point |
| Records | Actions take place without awaiting confirmation from user |
| Resolution | Groups of different fields, such as customer details |
| RGB | The quality of the display, the number of dots displayed |
| ROM | Red, Green, Blue video signal, produces the best display |
| RS-232 interface | Read Only Memory, Data stored on chips when manufactured |
| Scroll | A standard serial interface for communications and printers |
| Serial interface | To move the screen up or down as required |
| Software | Hardware allowing the transmission of data bit by bit |
| Source code | All programs running on the computer system |
| Spike | Text that a compiler/assembler works on, written by user |
| Spool | A massive voltage surge that can blow chips instantly |
| Sprite | Simultaneous Peripheral Operation On Line, spoolers send |
| Stack | data to another device without pausing the present program |
| Stream | A graphic object that moves independently of the program |
| String | An area of memory where data last in is first out |
| Synchronous | A path down which data flows to reach a channel |
| Terminal | A number of characters that can be considered together |
| Tractor feed | The transmission and receipt of data simultaneously |
| Track, ref PCB | Computer used just to send/receive data to/from another |
| Upload | A method of feeding fanfold paper by pulling the holes |
| Utility | An electrical path along which data flows on a PCB |
| Variable | To transmit data from a computer to a host computer |
| VDU | A program that carries out a useful function on a computer |
| Terminal | A named storage space which may hold a number of values |
| Vector Graphics | Visual Display Unit, often includes a keyboard, see |
| Viewdata | A computer used to send/receive data to another only |
| WIMP | The display of line graphics, often using a special monitor |
| Winchester | Common system to display data used eg, by Teletext/Prestel |
| Window | Window Icon Mouse Processing, displays data graphically |
| XMODEM | Commonly used alternative, see Hard disc |
| | An area of screen used independently from the rest |
| | A file transfer system that checks the data sent |

```

320 FOR row3=0 TO 10: nkey
7.5*gszsize,x+(gszsize*27)+(row3*(gszsize*7.
5)),y+(gszsize*4)+(gszsize*(7.5*2))
930 :
940 REMark *** Draw out fourth row of
keys ***
950 FOR row4=0 TO 9: nkey
7.5*gszsize,x+(gszsize*31)+(row4*(gszsize*7.
5)),y+(gszsize*4)+(gszsize*7.5)
960 :
970 REMark *** Draw out left and right
cursors ***
980 FOR row1=0 TO 1: nkey
7.5*gszsize,x+(gszsize*27)+(row1*(gszsize*7.
5)),y+(gszsize*4)
990 :
1000 REMark *** Draw out up and down
cursors ***
1010 FOR row1=0 TO 1: nkey
7.5*gszsize,x+(gszsize*95)+(row1*(gszsize*7.
5)),y+(gszsize*4)
1020 :
1030 REMark *** Draw out space bar ***
1040 skey
7.5*gszsize,53*gszsize,x+(gszsize*42),y+(gsi
ze*4)
1050 :
1060 REMark *** Draw out CTRL and ALT
keys ***
1070 skey
7.5*gszsize,12.5*gszsize,x+(gszsize*14.5),y+
(gszsize*4): skey
7.5*gszsize,12.5*gszsize,x+(gszsize*110),y+(
gszsize*4)
1080 :
1090 REMark *** Draw out shift keys
***
1100 skey
7.5*gszsize,16.5*gszsize,x+(gszsize*14.5),y+
(gszsize*4)+(gszsize*7.5): skey
7.5*gszsize,16.5*gszsize,x+(gszsize*106),y+(
gszsize*4)+(gszsize*7.5)
1110 :
1120 REMark *** Draw out caps lock ***
1130 skey
7.5*gszsize,12.5*gszsize,x+(gszsize*14.5),y+
(gszsize*4)+(gszsize*(7.5*2))
1140 :
1150 REMark *** Draw out tabulate key
***
1160 skey
7.5*gszsize,10.5*gszsize,x+(gszsize*14.5),y+
(gszsize*4)+(gszsize*(7.5*3))
1170 :
1180 REMark *** Draw out ENTER key ***
1190 entkey
15*gszsize,(13*gszsize)+1,x+(gszsize*109),y+
(gszsize*4)+(gszsize*(7.5*2))
1200 :
1210 REMark *** Turn on QL power on
LED ***
1220 INK#chan,4,2,1: FILL#chan,1:
LINE#chan,x+(4*gszsize),y+gszsize:
LINE_R#chan TO 0,gszsize*2 TO gsize,0 TO
0,-gszsize*2 TO -gszsize,0: FILL#chan,0:
INK#chan,7
1230 INK#chan,2,0: FILL#chan,1:
LINE#chan,x+(133.5*gszsize),y+gszsize:
LINE_R#chan TO 0,gszsize*2 TO gsize,0 TO
0,-gszsize*2 TO -gszsize,0
1240 FILL#chan,1:
LINE#chan,x+(162*gszsize),y+gszsize:
LINE_R#chan TO 0,gszsize*2 TO gsize,0 TO
0,-gszsize*2 TO -gszsize,0: FILL#chan,0:
INK#chan,7
1250 :
1260 END DEFine QL

```

The program will produce this output



The program as listed above is also available on microdrive cartridge, or 3.5" disc. Send us a blank media, and 50p, and we will send you a copy. We can also supply it on a cartridge for £2.00 sterling only please. We cannot accept foreign currency or stamps.

There is also a graphic demo program that uses the routine to good effect, for 640k QLS, that really shows what the QL can do. You will also need a ram disk program, preferably the one by Qflash or Qjump, but any will do.

Both programs have been added to our public domain software library in a slightly improved form. Programs that are printed in "QL S.U.B." will always be available from the library, but may be updated, and may include compiled versions where appropriate, documents giving further detail, and source code for machine code programs.

Any programs submitted to the library, and subsequently distributed remain the copyright of the author, in this case E.I.S., and cannot be reproduced in any form without consultation with us, and/or the author. No guarantee is given that any program will operate as stated, and that the program will be free from bugs in the version listed!

If you have a program that you think might interest other people, then please send it in. Programs in Pascal, Forth, BCPL, C, lisp, APL, assembler, archive, CP/M COBOL, or what have you, (aswell as SuperBASIC) are welcome, but please try to include some helpful documentation, and guidelines as to how to modify it, if it is that type of program. We can accept programs for consideration of microdrive or 3.5" disc, but not as printed hardcopy...

Future programs that will be featured in the FINEST HARDCOPY section of the magazine may include programs written as part of the programming courses that we expect to be running.

Remember, we are here to help. If you find a bug in the program, phone us!

```

100 REMark *** set output channel ***      ***
110 output=1                               560 DEFine PROCEDURE QL
120 MODE 4                                  <chan,size,x,y>
130 REMark *** open screen channel ***     570 LOCAL gsize
140 OPEN#output,scr_512x202a0x0          580 :
150 PAPER#output,2,0,3                   590 gsize=size/256
160 BORDER#output,1,2,0                  600 INK#chan,0: FILL#chan,1
170 REMark *** draw 3 qls ***            610 :
180 REMark *** window, size, xpos,ypos   620 REMark *** draw out ql casing ***
***                                       630 LINE#chan,x,y
190 QL output,70,75,75                   640 LINE_R#chan TO 0,gsiz*53 TO
200 QL output,125,50,50                   gsize*182,0 TO 0,-(gsiz*4) TO
210 QL output,250,5,5                     -(gsiz*53),0
220 REMark *** tidy up after use ***     650 LINE_R#chan TO 0,-(gsiz*44) TO
230 CLOSE#output                          <gsiz*53>,0 TO 0,-(gsiz*5) TO
240 STOP                                    -(gsiz*182),0
250 :                                       660 LINE_R#chan,gsiz*176,gsiz*5 TO
260 REMark *** Draw out normal key ***    0,(gsiz*44) TO gsize*8,0 TO
270 DEFine PROCEDURE nkey <ksize,x,y>    0,-(gsiz*44) TO -(gsiz*8),0
280 LINE#chan,x,y                          670 FILL#chan,0: INK#chan,7
290 LINE_R#chan TO 0,ksize TO ksize,0    680 LINE#chan,x,y
TO 0,-ksize TO -ksize,0                 690 LINE_R#chan TO 0,gsiz*53 TO
300                                       gsize*182,0 TO 0,-(gsiz*4) TO
LINE_R#chan,ksize/10,ksize-(ksize/5)    -(gsiz*53),0
TO ksize-(ksize/5),0                   700 LINE_R#chan TO 0,-(gsiz*44) TO
310 ARC_R#chan TO                          <gsiz*53>,0 TO 0,-(gsiz*5) TO
-(ksize-(ksize/5)),0,-4.1              -(gsiz*182),0
320 END DEFine key                       710 LINE_R#chan,gsiz*176,gsiz*5 TO
330 :                                       0,(gsiz*44) TO gsize*8,0 TO
340 REMark *** Draw out long key ***     0,-(gsiz*44) TO -(gsiz*8),0
350 DEFine PROCEDURE skey                 720 LINE#chan,x+<gsiz*129>,y:
<ksize,length,x,y>                     LINE_R#chan TO 0,gsiz*5
360 LINE#chan,x,y                          730 :
370 LINE_R#chan TO 0,ksize TO length,0   740 REMark *** add ql keyboard fluting
TO 0,-ksize TO -length,0               ***
380                                       750 INK#chan,7,0,3
LINE_R#chan,ksize/5,ksize-(ksize/5) TO  760 FOR groove=0 TO 6:
length-(ksize/2.5),0                   LINE#chan,x+<gsiz/2>,y+(gsiz*4)+(gro
390 ARC_R#chan TO                          ove*(gsiz*7.5)): LINE_R#chan TO
-(ksize/3),-(ksize-(ksize/3)), -2.2    gsize*128.5,0
400 LINE_R#chan TO                          770 FOR groove=1 TO 6:
-(length-((ksize/1.5)+(ksize/2.5))+1), LINE#chan,x+<gsiz*129.5>,y+(gsiz*4)+
0: LINE                                     <groove*(gsiz*7.5)>: LINE_R#chan TO
x+(ksize/5),y+(ksize-(ksize/5))         gsize*46.5,0
410 ARC_R#chan TO                          780 FOR groove=1 TO gsize*44 STEP
(ksize/3),-(ksize-(ksize/3)),2.2       gsize*1.5:
420 END DEFine skey                       LINE#chan,x+(gsiz*176.5),y+(4.5*gsiz
430 :                                       )+groove: LINE_R#chan TO gsize*7.5,0
440 DEFine PROCEDURE entkey              790 FOR groove=1 TO gsize*44 STEP
<ksize,length,x,y>                       gsize*2:
450 FILL#chan,1: INK#chan,0               LINE#chan,x+(gsiz*130)+groove,y+(gsiz
460 LINE#chan,x,y: LINE_R#chan TO        e*53): LINE_R#chan TO 0,-gsiz TO
0,(ksize/2) TO (length/2)-2,0 TO       gsize,0 TO 0,gsiz
0,(ksize/2) TO (length/2)+2,0 TO       800 INK#chan,7
0,-ksize TO -length,0                   810 :
470 FILL#chan,0: INK#chan,7              820 REMark *** Draw out function keys
480 LINE#chan,x,y: LINE_R#chan TO        ***
0,(ksize/2) TO (length/2)-2,0 TO       830 FOR fkey=0 TO 4: nkey
0,(ksize/2) TO (length/2)+2,0 TO       gsize*7.5,x+(gsiz*4),y+(gsiz*4)+(fke
0,-ksize TO -length,0                   y*(7.5*gsiz))
490                                       840 :
LINE_R#chan,(ksize/10),(ksize/2)-(ksiz  850 REMark *** Draw out top row of
e/10) TO (length/2)-3,0 TO 0,(ksize/2) keys ***
TO ((length/2)+4)-(length/5),0 TO     860 FOR row1=0 TO 14: nkey
0,-(ksize/2) TO 0,-(ksize/4)          7.5*gsiz,x+(gsiz*14.5)+(row1*(gsiz*
500 ARC_R#chan TO                          7.5)),y+(gsiz*4)+(gsiz*(7.5*3))
-(ksize/6),-(ksize/4)-(ksize/6)), -1.3 870 :
510 LINE_R#chan TO                          880 REMark *** Draw out second row of
-(length-((ksize/3)+(ksize/5))+4),0:   keys ***
520 LINE#chan,x+(ksize/10),y+(ksize/2)-(k  890 FOR row2=0 TO 11: nkey
size/10)                                  7.5*gsiz,x+(gsiz*25)+(row2*(gsiz*7.
530 ARC_R#chan TO                          5)),y+(gsiz*4)+(gsiz*(7.5*3))
((ksize/6)-2),-(ksize/2)-(ksize/6)),2  900 :
.2                                       910 REMark *** Draw out third row of
530 END DEFine entkey                     keys ***
540 :
550 REMark *** Draw out QL to scale

```

You are over half way there! Persevere, even if you think you'll never do it...

The competition started with 68k OS by GST, (supposedly written to be the one used by the QL, but then discarded because Sinclair's BASIC was too big), CP/M 68k from Quest, (which was designed to work best with their executive range of QL expansions, which also just about failed to materialise), OS/9 (which as far as I know never appeared) from Cumana, and finally, P system (a sort of operating system for Pascal and Fortran) from TDI, and CP/M 80 from various sources.

As there are at least two versions of CP/M 80 (don't worry about the name yet- we'll explain) on the QL, and the others are no longer available, and increasing numbers of people are using micros at work, normally either the Amstrad PCW wordprocessors, or cheap IBM PC clones such as the Amstrad series, CP/M and MS/DOS are also the most likely operating systems you will come across away from the QL.

CP/M a personal answer

CP/M was written by Digital Research, originally for the author's own micro which he felt needed a more convenient system of writing and running programs on. With development, the program has developed into CP/M as it is now, and influenced Microsoft considerably when they were designing MS/DOS.

CP/M stands for Control Program for Microcomputers. It is described significantly differently from QDOS. It is an operating system intended for use on microprocessor based systems that support a single user at any time, carrying out a single task at any one time. The system, that is the standard code, and utilities, includes file maintenance, facilities for inspecting and updating memory, and access to assemblers and compilers.

CP/M 80 is simply a version of CP/M that was written to run on an 8080 or Z80 processor. (There is a Z80 in a Spectrum or an Amstrad PCW 8256.) As the QL has a 68008, it has to simulate a totally different chip in order to run programs intended for CP/M 80, for which there is a lot of software.

MS/DOS stands for Microsoft Disc Operating System. It was first produced as PC/DOS for the IBM personal computer, but as similar machines became available, MS/DOS quickly became the standard for that type of machine. Again, MS/DOS is a single user, single task OS.

Now we shall actually go on to see what the differences are between QDOS, CP/M and MS/DOS, introducing concepts, and comparing commands available. The explanation will be kept relatively simple, describing how to run programs on other the those operating systems, maintain your files in some order, and

hopefully avoid some of the pitfalls.

Further reading?

If you need a more in depth knowledge of any of the operating systems, (and that includes QDOS) we suggest that you buy a book on the subject. The level of sophistication that one could go to is far beyond the scope of this article, although if you have any particular problems, then we would be pleased to try and help you with them.

In particular there are a number of toolkits which add vast numbers of commands to SuperBASIC, and many new extensions to QDOS that make it far more sophisticated and will form part of future compatible machines, and implement extremely powerful features currently not available as standard, such as real windowing, and code sharing between programs, and...

Fundamental Concepts

All machines have various devices attached to them, and can communicate with them via particular interfaces. On machines running QDOS, CP/M, and MS/DOS, there are some names that have to be understood before the machine can be used to most effect.

(From now on, we will refer to both microdrive cartridges and discs as discs, and all occurrences of mdv will be replaced by flp for convenience.)

The screen output has a name

| | | |
|--------|------|----------------------|
| QDOS | scr_ | screen display only |
| CP/M | con_ | keyboard and display |
| MS/DOS | COM: | keyboard and display |
| | CON: | keyboard and display |

The disc drives have a name

| | | |
|------|-------|-----------------|
| QDOS | flp1_ | first (left?) |
| | flp2_ | second (right?) |

(More drives have numbers up to 8- other types of storage have other names, and numbers starting at 1- for example, ram2_ ram disc two, win1_ hard disc one)

| | | |
|------|----|-----------------|
| CP/M | A: | first (left?) |
| | B: | second (right?) |

(More drives have other letters)

| | | |
|--------|----|-----------------|
| MS/DOS | A: | first (left?) |
| | B: | second (right?) |

(More drives have other letters- a hard disc is often drive C.)

The printer sockets have names

| | | |
|------|-------|--------------|
| QDOS | ser1_ | first socket |
|------|-------|--------------|

(Another option is par_ is you have got an extra interface with a parallel port, for plugging a printer into.)

| | | |
|------|------|-----------------|
| CP/M | PRN: | standard socket |
|------|------|-----------------|

| | | |
|--------|------|-----------------|
| MS/DOS | PRN: | LST: or LPT1: |
| | | various sockets |

Any communications sockets have names

| | | |
|--------|------------|-----------------|
| QDOS | ser2_ | second socket |
| MS/DOS | AUX: COM1: | or COM2: |
| | | various sockets |

Investigation

What is under examination now?
Each month something unusual.
We focus on CP/M and MS/DOS compared with QDOS.

The QL has been described as both a good machine with a bad operating system, and a bad machine with a good operating system, and it has even been described as a good machine with a good operating system, and a bad machine with a bad operating system...

So now all that is over, what is the point of all this? The QL has both a unique hardware design, and a unique operating system. That is the point. However, of the two, the operating system, QDOS, is the soul of the machine, and is how you recognise the QL, or compatible, from the rest.

What are Operating Systems?

What is an operating system? The Oxford Dictionary of Computing says "operating system (OS) The set of software products that jointly controls the system resources and the processes using these resources on a computer system." To many people, it is the environment, or the personality of a computer system.

Every computer has an operating system of some kind, which is needed to manage the computer memory, interpret what is keyed in on the keyboard, and to operate the display screen. Of course, there are also commands to handle various media, whether it be cassette, floppy disc, hard disc, or whatever. On many operating systems, parts, or even the complete operating system are held on disc, the only part of the program held on ROM being the instructions to load the rest of it.

QDOS? A Quantum Leap?

QDOS presumably stands for Quantum Disc operating system. (Unfortunately, there was another operating system in days gone by called QDOS— and then the name QDOS stood for "Quick and dirty operating system"! QDOS is certainly not that on either count... QDOS is certainly more advanced or some would say more ambitious than other machines that were launched at the same time as it. No other machine of the time could offer such power, in theory at least, as the QL using QDOS.

QDOS is described as a "single-user, multi-tasking operating system". It provides the means for a number of independent programs to run at the same time (concurrently) on the QL, but does not provide any mechanisms to prevent those programs from wrongly

interfering with each other.

A comprehensive technical manual about QDOS is available to software writers, and all the legal uses of the code provided in the ROM of QLs is listed. It describes the functions of QDOS as being to provide a set of useful routines for performing functions such as memory allocation, input/output, etc., a mechanism for maintaining lists of things to be done, including the function of allocating slots of CPU time to programs which require them, and a mechanism for starting up the computer, and determining the configuration of any add-on hardware that is connected to it.

Unfortunately, the ROMs provided on the early QLs were less than reliable, and the code had many bugs in it. To discuss the results of those problems is another matter, and you will find a section in this issue about the QL's history, and another on its future.

Conform or break free?

It is important to note that we are only talking about operating systems on microcomputers— larger computers use very different operating systems, although in a way QDOS is more like them, than those used on other micros.

The most widely used operating systems at present are CP/M, and MS/DOS called PC/DOS on IBM systems, although there are a number of other machines in use today that have gone their own way, notably the BBC Micros by Acorn, and the Commodore Amigas by Commodore. (Although the Atari ST series uses an operating system called TOS, it is actually just a version of CP/M.)

Here we will be comparing the features of QDOS with those of CP/M, and MS/DOS without particular reference to any machine in particular. The idea of an operating system is that the same code will run on any machine with that OS, regardless of the hardware design.

Can a standard be added?

Although the resident operating system is QDOS, there have been a number of efforts at implementing other standard operating systems on the QL. Each claimed to allow the QL to use more software, be more standard, and hence, more successful. As we all know, it has not done badly using QDOS!

MOVING TARGET!

**A LITTLE COMPETITION NEVER
GOES AMISS. DON'T MISS THIS!**

SUPER USER BUREAU is an organisation that is constantly looking for new services, and offers for our members. The more members we have, the more services we can offer, and the better the offers on the products that we stock, we can make. The cost of each issue of this magazine is paid for out of subscriptions, not from large chunks of the magazine being taken up with advertising.

We need your support in order to make "QL S.U.B." magazine bigger and better. If you have ideas about how we can develop the service, then please contact us. If you decide not to subscribe to the magazine, and take advantage of our services, then please let us know why. We need your feedback to improve S.U.B. for users.

If you have decided to subscribe, then we would still welcome any comments, or ideas that you have. Also, if you have any friends with QLs, then let them know about our service. We will award any person who recommends a friend who subsequently subscribes with an extra month subscription to the magazine.

We will also reward whoever sends in the most helpful suggestion each month with a similar benefit, or a discount on membership to non members. We need to develop in line with QL users' needs...

Normally, each month we run a competition requiring the logical, intuitive, or intellectual use of members' grey matter to solve a problem, or create a solution to a QL problem. The prizes are either the choice of goods to a certain value, or an item that we have been reviewing, always the most up to date products.

REMEMBER, THE COMPETITION, AND PRIZES OFFERED, CHANGE

EVERY MONTH...

The Simple Commands

The first command that anyone wants on a system are those concerned with what is known as housekeeping. That is, those commands concerned with keeping track of what files are where, and what they are called.

To format a new disc, to blank it
QDOS format flp1_filename
CP/M format a:
MS/DOS format a:

CP/M and MS/DOS may have parameters to use with format to give a disc a name, and to select the type of disc format

To get a directory, a list of files
QDOS dir flp1_
CP/M dir a:
MS/DOS dir a:

To delete a file on the disc
QDOS delete flp1_filename_ext
CP/M era a:filename.ext
MS/DOS delete a:filename.ext

To copy a file on a disc to another
QDOS copy flp1_filename_ext
to flp2_filename_ext
CP/M The version you use will have a copy program, usually called PIP and will have information on it.
MS/DOS copy a:filename.ext b:

To look at a file on the screen
QDOS copy flp1_filename_ext
to scr (or con)
If SuperToolkit2 is available, you can use view flp1_filename_ext
CP/M type a:filename.ext
MS/DOS type a:filename.ext

To clear the screen of text
QDOS cls
CP/M cls or CTRL L
MS/DOS cls or CTRL L

To execute a program type
QDOS EXEC W flp1_filename_ext
or EXEC flp1_filename_ext
(The first option waits until the program has finished before returning)
CP/M filename
MS/DOS filename

(The difference in the way to execute a program in QDOS from the others is that QDOS has a command language, and the other do not. SuperBASIC is the QDOS command language.)

To go into BASIC
QDOS Already in SuperBASIC
CP/M BASIC
MS/DOS BASIC
(Both the example of CP/M and MS/DOS presume that the disc containing BASIC is in the default drive.)

To go into another language
QDOS Depends on system, but usually EXEC flp1_language_ext
CP/M language
MS/DOS language

There are several other advantages and disadvantages of QDOS when you compare it with CP/M and MS/DOS. QDOS looks to be at a considerable disadvantage when you compare the flexibility and power of the facilities for passing parameters to programs, and in the handling of directories. Although we have not mentioned them here, both the other operating systems can handle these functions, and have commands to do so.

On closer analysis of QDOS, it becomes evident that it is not that QDOS can't handle these functions, but rather that SuperBASIC does not implement them. Although it would be the subject on an entire article to discuss the huge number of extensions to QDOS, and SuperBASIC provided by Qjump Super Toolkit 2, it must be pointed out that most of the apparent deficiencies in QDOS are in fact deficiencies in the scope of SuperBASIC commands.

To consider that the existing ROM of the QL is 48K, and Super Toolkit 2 is 16K, it starts to look as though it would have been a good idea to include it as standard on the QL to fill up all the available ROM space on the standard machine. As it is, anyone who does not have it, should consider buying it, as it is a natural part of SuperBASIC and improves existing code.

As both CP/M and MS/DOS do not have a built in command language, or BASIC, they do not contain any programming commands. However, there is a large extension called GSX, a comprehensive graphics suite for CP/M systems that will support complex screen graphics. It can be used on the Amstrad PCW machines for example to display some graphics from any appropriate program.

Most users of MS/DOS machines are running machines that are IBM "PC" compatible, and so the programs can take advantage of the IBM calls to various different graphics modes, and graphics commands. The problem here is that with the multitude of clones, it is possible for programs to use the graphics extensions incorrectly, and make themselves incompatible with some systems that are not identical.

The QL, having an operating system and language combined on ROM, rather than loading it off disc, can offer a large library of complex graphic routines, including the windowing system, and any extensions that may be installed.

The QL operating system is ideally suited to an expandable system. It does not require configuring like other systems, as it automatically uses appropriate extensions itself, and can update itself by linking code to replace existing routines. It is a thoroughly modern operating system!

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Please keep your adverts to 50 words maximum. We will not print any commercial adverts, from traders, as the advertising is so very low that *everyone* can afford to use it for their products. If you might be interested in advertising, then ask for more information.

Use this section for all things QL.

Contacting other QL users in your area, contacting other QL users abroad as penpals, contacting other QL users with particular uses of their machines, or particular interests, such as programming in SuperBASIC, Pascal, 68000 assembler, C, BCPL, Lisp, Fortran 77, or whatever you use, hints and tips for Archive or the other PSION QL packages, hints and tips on playing QL arcade games, QL adventures, QL communications, QL hardware, or QL clubs and local user groups. What about telling other QL users about that odd experience with a QL program, or a nasty bug that you've found? Oh, and you could even advertise that package you bought, but don't like, or that QL expansion card that you don't need now you have upgraded to a new QL compatible. To give you the idea, we have an ad for display here.

WANTED, any unusual commercial program, or piece of hardware from the past. Enquire in writing about level of interest, from Richard, PO BOX 3, SHILDON, DL4 2LW. (This is a real advert, not just an idea!)

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BENEFITS IN STORE

THE SPECIAL DEALS FOR READERS THAT WE HAVE ARRANGED

As we keep explaining, this issue is rather different from the usual monthly issues of "OL S.U.B." because it contains only information that will be of interest to readers now, in a week, or in a year. Therefore we have not included a list of deals currently available, but you should have received our current product and price list. If you are reading someone else's copy and you do not have the current list, or it is rather out of date, then give us a ring, and we will send you another one.

Some people are still a bit confused about how to benefit from our special offers, so we shall just run through and explain. Unlike some user groups, we are a full time commercial support group, and therefore we can offer both members and even non members special deals, although naturally we can extend special promotion discounts and standard product discounts to members.

This means that if you send us an order direct for any goods that we list, or any goods that you have asked us to quote a price on, then we can supply, usually from stock, but always from the fastest source. Members can take advantage of their special discount structure, meaning that a member may well save the cost of subscription on the goods ordered from us during the year. That certainly makes a subscription good value!

We stress that you cannot benefit from these discounts if you order direct from the supplier or manufacturer. The offers are arranged by us, and are only available through us. Of course, if you see something we offer cheaper elsewhere, then you are advised to consider buying them, but do bear in mind that you can only get the support and unique after sales service that we offer to all our customers, direct from us...

We stock all the leading brands, and we can supply products for other computers than the OL, should you so wish. We can supply most makes of printer, computer supplies, even office furniture, and we will try to find anything you need that we don't already supply, or have a source for. But remember, we are OL specialists, and we always put OL users' needs first.

SORRY CASH WITH ORDER ONLY

Backspace "Jargon"

It seems that to many people the world of computing is something that is too complex or hi-tech to come to terms with. You may be wondering why I am talking about those people who cannot relate to computers, when you own a QL, and are probably trying to learn more about it. There are many computer users who do not want to learn more, or think they cannot learn more about them, and they have the power to shape the future of computing from outside.

The QL has a surprisingly wide range of users, with both home, and business uses of the machine. In this respect, the QL seems to be used in the main by those people at whom Clive Sinclair originally targeted the machine, and the concept, the home professional. People who have bought a QL have made a positive statement to rely on their own judgement; in buying a machine that does not conform to the standard. QL users are unusual in this respect.

Playing games on a computer is not an end in itself, but rather a use of the computer for entertainment. Running the company accounts, or forecasts is only a quick way of reporting or examining the position of a business. Doing wordprocessing on a computer is not a new task, only a quick and more efficient way of producing your daily correspondence than a typewriter. Surely computers are just tools? Tools for business, office efficiency, or entertainment, whatever your age, sex, or experience of "hi-tech".

Reading the computer magazines on the shelves of the well known newsagents is hardly an enlightening experience for those new to computers, or to those who want to break into the "secret world" of computing.

All too often, jargon is used without any explanation, and reference is made to programs or equipment that the journalists have already used or reviewed previously. It almost seems as if the world of computing is protecting itself from the threat of freedom of information, knowledge, and ease of use by building a wall of jargon through which no outsider can wander. Computing is projected as something for the elite, not the masses, as an agent of control, rather than of freedom.

To many people, it seems, there is a new language to learn. If you were not "in at the start", then you are too late. Reading some articles you begin to think that you are the only person who is so behind the times, as not to own a new portable PC/AT with 16mb of RAM, an 80386, VGA graphics, and PS/2. Those "in the know" have all this and more. If you don't understand, don't worry, ninety percent of the big mags readers don't either. The truth is that no one is really completely in the know, even if they think they are.

Often when I explain to computer "illiterate" people about possible advantages of computerising, for example, I find that although I use normal English statements, they hear different language, and give hidden meaning to my words as soon as they realise I am talking about computing.

Likewise, I have found on a number of occasions that people who think they know a little about computers are even less likely to be able to learn than people who think they know nothing and think they never will. For example, I was recently told by a small business consultant that the only proper micro-computers are by IBM, and Sinclair computers in particular, don't work. He had never actually used one, or seen one, but the IBM salesman had told him that was the case...

What can be done about this problem? How can those "in the know" pass on their experience, to those who think they will never be "in the know", if it is in the interest of large computer companies to increase the apparent gulf between those in the know, and those who need to know.

If you are reading this, then it is highly likely that you are, to many people, a computer "boffin". You may think you are not, (or you may think you are) but either way, people may well perceive you as such, just because you own your own computer.

Basically, there is no easy answer as far as I can see, to the problem of people having a perceived inability to use and learn about computers. In the long run, the present educational campaign for further "exposure" of small children to computing will pay dividends, even though there is far too little being done, and the support from the industry for it is very poor.

There is actually a real phobia that some people experience of computers. I have heard of people being actually scared of touching computers, or being near them, and some people have been known to break down in tears when asked to learn a little about them.

General paranoia about the world comes into computing more than one may first realise. Why is there only one main standard dominating at present? Why is there such a rush to move over to new PS/2, and OS/2 for IBM, and compatible users? Why is everyone so protective of their new products? Why is there so much jargon invented and used?

If you devise your own world, and your own language, then nobody can tell you that you're wrong. You can't criticise if you don't even understand can you?

Are people in computing are still thinking like the children who sit in a class thinking that they are wrong to think differently because other children in the class would laugh at them. No surely not...

ON RECORD

Unfortunately, we can't yet arrange interviews with Sir Clive Sinclair "just like that", but we can report a few of the things that he, and others have said about the QL in the past. The comments make interesting reading in the light of his present machine, the Cambridge Computers, 288.

The QL was seen at launch as being an unusual, but good value option for the "home professional", a new breed of user, unknown at the time. "The QL has been designed for serious personal use. Most of the sales will be to people who would like a business computer, but cannot afford the cost associated with such a purchase."

Talking about the QL at £400, at the time of launch one reviewer commented "the QL is certainly a Quantum Leap above the present sub £1000 micros, but it is a risky market and Sinclair could become unstuck if he fails to deliver the goods in required quantity and quality." We know what happened...

Sir Clive saw the education market as being extremely important for the QL. In an interview with PCN magazine he claimed confidently "The time comes for something to be replaced and the BBC machine was an excellent machine in its time ... clearly we are able to offer an enormously more powerful machine, so it seems right for a change. It's just a case of working down from the top down ... it is not any more of a problem than replacing one text book with another. I think the QL will become a standard in the universities. They need much more powerful machines... (than the BBC)"

"They are not going to throw out the BBC machines overnight... but as they replace them, or buy new machines, they will go for the QL, partly because it will be the university standard and more so because it is so much better value", he added. The QL is well supported with languages, and is popular among students, by it has hardly swept the market in education.

One of the first reviews was in PCN magazine, and although testing a very unfinished machine, the verdict set a mood for the future- "If everything were in place, then I would consider this machine very seriously as a truly personal computer, but not something to run a business on." However, many business decided to, and still do.

Reviewers had mixed comments about the machine, but felt that it was a good package, especially because of the inclusion of the Psion packages. "The

supplied applications are just what the professional user needs to get started.", "The Psion packages look very good in terms of the range and quality of facilities offered.", "The 'free' software ... is good." The same reviewer added, commenting on numerous bugs in the early versions, "However, the 'you can't complain for the price' attitude doesn't apply. Many users are going to buy the QL purely because four pieces of software are thrown in, and many are no doubt intending to use these packages in their businesses."

Some reviewers were more enthusiastic than ever about the machine. "In all the QL is a system offering an amazing amount of power and facilities for a very low price. Watch IBM turn from blue to green!" We all make mistakes.

I think that the closing comments from the first full review were among the most accurate. "The bottom line is that the QL gives you the potential to own a complete serious computing facility, including printer and essential software..." Then, the end of the sentence was "for £1000". Now, the QL user can have a complete system for a quarter of that, and an enormously powerful system for half of it.

The development of the QL was typical of Sinclair. The machines have always been launched to create markets which subsequently followed along. Sir Clive clearly had few definite plans for the QL. "When we introduced the Spectrum, we didn't know what we would do next, and now we've launched the QL, we don't know in what direction this machine will take us..." I wonder if he would have still launched it, had he known what path the QL, and other innovations would lead him?

Recently he commented "I think funnily enough, that the 16 bit machines were and are a mistake. We were pioneers when we came out with the QL ... and the irony is that really the 16 bit machines are not doing anything that the 8 bit machines couldn't have done." It will be hard to convince the QL, ST, and Amiga owners that he is right, as the interviewer noted at the time.

Then what would Sir Clive say now, if he was launching a similar machine, and what would those same reviewers say about the machine as it is today?

Perhaps noting the change of heart in some of the computer press towards the QL is some indication of its success, perhaps looking at the 288 we can see history in the making, and perhaps Sir Clive has learnt from his mistakes...

